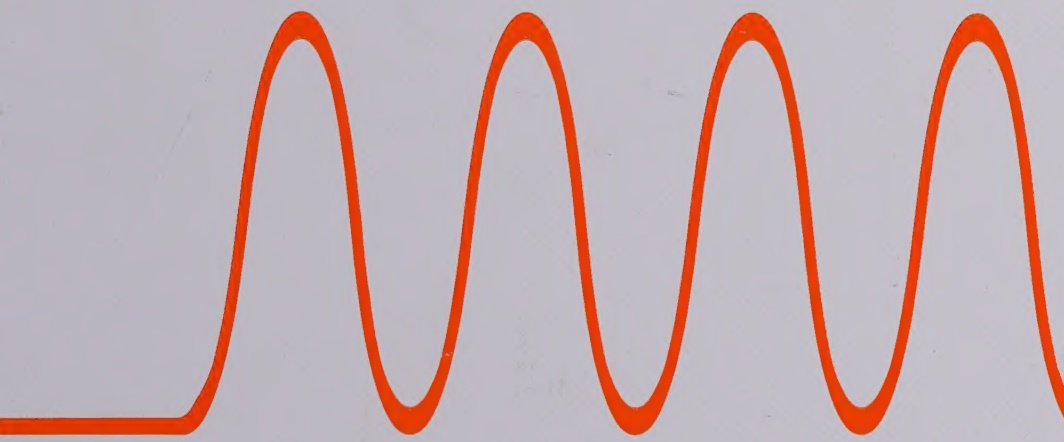

ar AMPLIFIER RESEARCH

Operating and Service Manual

MODEL

50S1G4A

PART NUMBER

1010539-501

SERIAL NUMBER

304275

AMPLIFIER RESEARCH
Souderton, PA 18964-9990 USA
TEL 215-723-8181 TWX 510-661-6094 FAX 215-723-5688

Operating and Service Manual

⚠ INSTRUCTIONS FOR SAFE OPERATION

BEFORE APPLYING POWER

Review this manual and become familiar with all safety markings and instructions.

Verify that the equipment line voltage selection is compatible with the main power source.

Protection provided by the equipment may be impaired if used in a manner not specified by Amplifier Research.

INTENDED PURPOSES

This equipment is intended for general laboratory use in a wide variety of industrial and scientific applications. It is designed to be used in the process of generating, controlling, and measuring high levels of electromagnetic Radio Frequency (RF) energy. Therefore, the output of the amplifier must be connected to an appropriate load, such as an antenna or field-generating device. It is the responsibility of the user to assure that the device is operated in a location which will control the radiated energy such that it will not cause injury and will not violate regulatory levels of electromagnetic interference.

HAZARDOUS RF VOLTAGES

The RF voltages on the center pin of the RF output connector can be hazardous. The RF output connector should be connected to a load before AC power is applied to the amplifier. Do not come into contact with the center pin of the RF output connector or accessories connected to it. Place the equipment in a non-operating condition before disconnecting or connecting the load to the RF output connector.

SAFETY GROUND

This equipment is provided with a protective earth terminal. The main power source to the equipment must supply an uninterrupted safety ground of sufficient size to the input wiring terminals, power cord, or supplied power cord set. The equipment **MUST NOT BE USED** if this protection is impaired.

PHYSICAL DAMAGE

The RF amplifier should not be operated if there is physical damage, missing hardware, or missing panels.

MAINTENANCE CAUTION

Adjustment, maintenance, or repair of the equipment must be performed only by qualified personnel. Hazardous energy may be present while protective covers are removed from the equipment, even if disconnected from the power source. Contact may result in personal injury. Replacement fuses are required to be of specific type and current rating.

⚠ INSTRUCTIONS FOR SAFE OPERATION *(continued)*

SAFETY SYMBOLS

This symbol is marked on the equipment when it is necessary for the user to refer to the manual for important safety information. This symbol is indicated in the "Table of Contents" to assist in locating pertinent information.

Dangerous voltages are present. Use extreme care.

CAUTION: The caution symbol denotes a potential hazard. Attention must be given to the statement to prevent damage, destruction, or harm.

Indicates protective earth terminal.

RANGE OF ENVIRONMENTAL CONDITIONS

This equipment is designed to be safe under the following environmental conditions:

Indoor use

Altitudes up to 2000M

Temperature of 5°C to 40°C

Maximum relative humidity 80% for temperatures up to 31°C. Decreasing linearity to 50% at 40°C.

Mains supply voltage fluctuations not to exceed ±10% of the nominal voltage or minimum and maximum autoranging values.

Pollution degree 2: Normally non-conductive with occasional condensation

While the equipment will not cause hazardous condition over this environmental range, performance may vary.

COOLING AIR

Care should be exercised not to block the cooling air inlets or outlets. Cooling air blockage can result in damage to the RF amplifier or intermittent shut-downs.

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SECTION I

GENERAL INFORMATION

1.1 GENERAL DESCRIPTION

The Model 50S1G4A is a self-contained, broadband microwave amplifier designed for laboratory applications where instantaneous bandwidth, high gain, and moderate power output are required. A "GAIN" control, located on the front panel, can be used to decrease the amplifier gain by 10 decibels (dB) or more. Solid state technology is used exclusively to offer significant advantages in reliability and cost. A Model 50S1G4A, when used with a frequency-swept signal source, will provide 50 watts of swept power output from 0.8–4.2GHz. Typical applications include antenna and component testing, wattmeter calibration, and electromagnetic interference (EMI) susceptibility testing, as well as usage as a driver for frequency multipliers and high-power amplifiers. The Model 50S1G4A can be operated locally by using the front panel controls, or remotely by using either an IEEE-488 or RS-232 interface.

1.2 POWER SUPPLIES

The Model 50S1G4A contains switching power supplies. The input voltage range to the power supplies is 90–132 or 180–264 Volts Alternating Current (VAC), 50/60Hz, selected automatically. The operator does not have to switch or change anything on the Model 50S1G4A when changing the AC input voltage. AC power consumption is 600 watts nominal. A built-in circuit breaker provides primary AC circuit protection.

1.3 SPECIFICATIONS

Refer to the "Amplifier Research Data Sheet" on the following page for detailed specifications. All voltage measurements referenced in this manual are Direct Current (DC) unless stated otherwise.

160 School House Road, Souderton, PA 18964-9990 USA
Phone 215-723-8181•FAX 215-723-5688

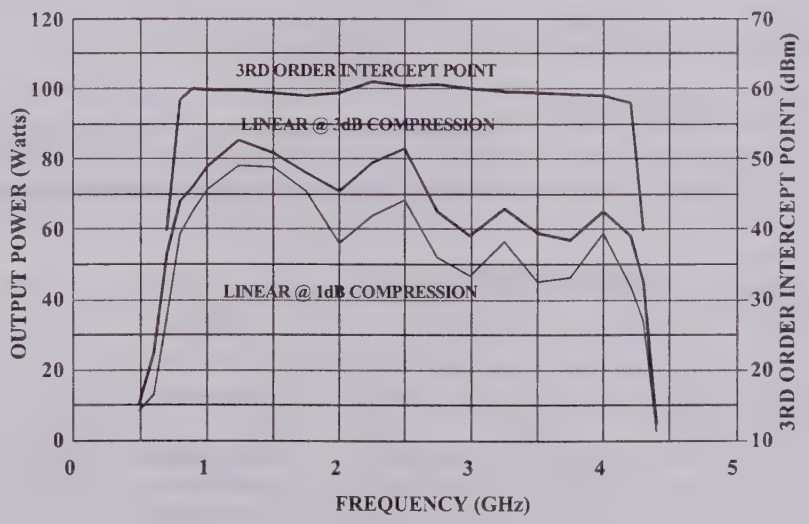
MODEL 50S1G4A
M1, M2, M3, M4
50 WATTS CW
0.8 – 4.2 GHz

The Model 50S1G4A is a solid state, self-contained, air-cooled, broadband amplifier designed for applications where instantaneous bandwidth, high gain and linearity are required. Housed in a stylish contemporary cabinet, the unit is designed for benchtop use, but can be removed from the cabinet for immediate equipment rack mounting.

The 50S1G4A, when used with a sweep generator, will provide a minimum of 50 watts of RF power. Included is a front panel gain control which permits the operator to conveniently set the desired output level. The 50S1G4A is protected from RF input overdrive by an RF input leveling circuit which controls the RF input level to the RF amplifier first stage when the RF input level is increased above 0 dBm. The RF amplifier stages are protected from over-temperature by removing the DC voltage to them if an over-temperature condition occurs due to cooling blockage or fan failure. There is a digital display on the front panel to indicate the operate status and fault conditions if an over-temperature or power supply fault has occurred. The unit can be returned to operate when the condition has been cleared. The 50S1G4A digital panel provides control of all amplifier functions both locally and remotely via IEEE-488 (GPIB) or RS-232 interfaces.

The low level of spurious signals and linearity of the Model 50S1G4A make it ideal for use as a driver amplifier in testing wireless and communication components and subsystems. It can be used as a test instrument covering multiple frequency bands and is suitable for a variety of communication technologies such as CDMA, W-CDMA, TDMA, GSM etc. It is also suitable for EMC Test applications where undistorted modulation envelopes are desired.

50S1G4A
Typical Performance



REV072400

SPECIFICATIONS
Model 50S1G4A

RATED POWER OUTPUT ..... *50 watts minimum*

INPUT FOR RATED OUTPUT ..... *1.0 milliwatt maximum*

POWER OUTPUT @ 3dB COMPRESSSION
Nominal ..... *70 watts*
Minimum ..... *50 watts*

POWER OUTPUT @ 1dB COMPRESSION
Nominal ..... *60 watts*
Minimum ..... *40 watts*

FLATNESS ..... *±1.5 dB typical*
..... *±2.0 dB maximum*

FREQUENCY RESPONSE ..... *0.8 – 4.2 GHz instantaneously*

GAIN (at maximum setting) ..... *47 dB minimum*

GAIN ADJUSTMENT .....*(Continuous Range)*
.....*10 dB minimum*
..... *(4096 steps remote)*

INPUT IMPEDANCE ..... *50 ohms*
.....*VSWR 2.0:1 maximum*

OUTPUT IMPEDANCE ..... *50 ohms, nominal*

MISMATCH TOLERANCE

100% of rated power without foldback. Will operate without damage or oscillation with any magnitude and phase of source and load impedance. (See Application Note #27)

MODULATION CAPABILITY

Will faithfully reproduce AM, FM, or pulse Modulation appearing on the input signal

THIRD ORDER INTERCEPT

See chart. The third order intercept points for this chart have been determined using two tones spaced 1 MHz apart. This is typical for W-CDMA systems. Closer tone spacing such as 60 kHz generally provides about a 1db to 3db improvement in the IP.

HARMONIC DISTORTION .....*Minus 20 dbc*
.....*max at 50 watts*

SPURIOUS .....*Minus 73 dbc Typ.*

PHASE LINEARITY ..... *± 1.0 deg/100 MHz, Typ*

PRIMARY POWER..... *(Selected Automatically)*
..... *90-132, 180-264 VAC*
.....*50/60 Hz, single phase*
.....*600 watts maximum*

CONNECTORS
RF..... *Type N female*
REMOTE INTERFACES
IEEE-488.....*24 pin*
RS-232.....*9 pin Subminiature D*

SAFETY INTERLOCK..... *15 pin Subminiature D*

COOLING ..... *Forced air (self contained fans)*

MODEL CONFIGURATIONS

MODEL NUMBER``	RF INPUT	RF OUTPUT	WEIGHT	SIZE (W x H x D)
50S1G4A	Type N female on front panel	Type N female on front panel	45 kg (100 lbs)	50.3 x 24.9 x 37.6 cm 19.8 x 9.8 x 14.8 in
50S1G4AM1	Type N female on rear panel	Type N female on rear panel	45 kg (100 lbs)	50.3 x 24.9 x 37.6 cm 19.8 x 9.8 x 14.8 in
50S1G4AM2	Same as 50S1G4A with enclosure removed for rack mounting		32 kg (71 lbs)	48.3 x 22.2 x 37.6 cm 19.0 x 8.75 x 14.8 in
50S1G4AM3	Same as 50S1G4AM1 with enclosure removed for rack mounting		32 kg (71 lbs)	48.3 x 22.2 x 37.6 cm 19.0 x 8.75 x 14.8 in
50S1G4AM4	Same as 50S1G4A optimized for improved linear power output and 3rd order Intercept point from 1.7 to 2.7 GHz. The power output and gain can be as much as 3dB lower than normal specification at 4.2 GHz		45kg (100 lbs)	50.3 x 24.9 x 37.6 cm 19.8 x 9.8 x 14.8 in

SECTION II

OPERATING INSTRUCTIONS

2.1 GENERAL

Operation of the Model 50S1G4A broadband microwave amplifier is simple. The input signal, whether swept or fixed in frequency, is fed into the jack marked **"INPUT"** and the amplifier output signal is taken from the jack labeled **"OUTPUT."** The unit is turned "ON" by activating the power switch. A circuit breaker in the AC line provides protection in the event of a unit malfunction. A polarized, three (3)-wire AC power cord is also included with the unit to provide cabinet and chassis grounding to the power mains.

⚠ CAUTION:

OPERATION OF THE MODEL 50S1G4A AMPLIFIER IS NOT CRITICALLY AFFECTED BY SOURCE AND LOAD VOLTAGE STANDING-WAVE RATIO (VSWR), AND THE UNIT WILL REMAIN UNCONDITIONALLY STABLE UNDER ANY MAGNITUDE AND PHASE CONDITIONS OF SOURCE AND LOAD. THE MODEL 50S1G4A HAS ALSO BEEN DESIGNED TO WITHSTAND RF INPUT POWER LEVELS AS HIGH AS 20MW—TWENTY (20) TIMES ITS RATED INPUT POWER LEVEL OF 1MW—WITHOUT SUSTAINING DAMAGE. HOWEVER, RF INPUT POWER LEVELS GREATER THAN 20MW OR TRANSIENTS WITH HIGH PEAK VOLTAGES CAN DAMAGE THE AMPLIFIER. ALSO, ACCIDENTAL CONNECTION OF THE MODEL 50S1G4A's OUTPUT TO ITS INPUT CAN CAUSE OSCILLATIONS THAT WILL PERMANENTLY DAMAGE THE UNIT'S INPUT CIRCUITRY.

IMPORTANT NOTE:

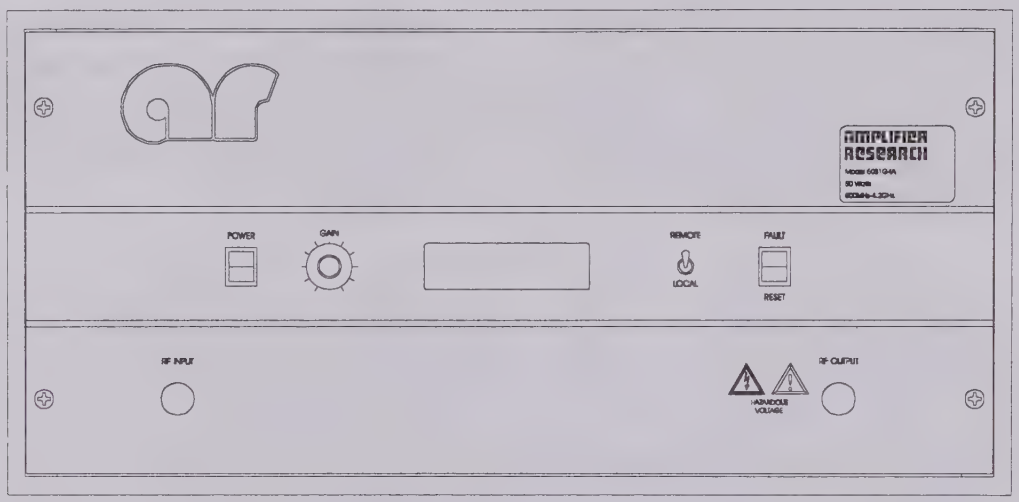
ALTHOUGH THE MODEL 50S1G4A IS DESIGNED TO OPERATE WITHIN THE OVERDRIVE AND LOAD TOLERANCE CONDITIONS DESCRIBED ABOVE, SUBJECTING THE AMPLIFIER TO THESE CONDITIONS SIMULTANEOUSLY CAN CAUSE FAILURE OF THE UNIT'S OUTPUT TRANSISTORS. REPEATED FAILURES OF THIS NATURE WILL NOT BE COVERED UNDER THE UNIT'S WARRANTY.

The Model 50S1G4A Amplifier is protected from input overdrive by an Automatic Level Control (ALC) Circuit that limits the maximum RF level to the first gain stage (Q1) of the RF Amplifier to approximately 0dBm.

The Model 50S1G4A's RF power transistors are protected from over-temperature by a sensor that senses the heat sink temperature near the RF output transistors. In the event of a cooling fan failure or an air flow blockage, the DC voltage will be removed from the RF stages; if and when the heat sink temperature reaches approximately 70°C. The (VFD) vacuum flourescent display on the unit's front panel will indicate "Thermal Fault". Normal operation can be resumed by resetting the amplifier after the heat sink temperature drops below 70°C.

2.2 AMPLIFIER OPERATION

Figure 2-1 shows the front panel of the Model 50S1G4A Broadband Microwave Amplifier.



2.2.1 Local Operation

Power-up Sequence:

1. Connect input signal to **"INPUT"** connector. **The input signal level should be 0dBm maximum.**
2. Connect load to **"OUTPUT"** connector.
3. Set the **"LOCAL/REMOTE"** switch to **"LOCAL."**
4. Check to see that the MAIN POWER switch (circuit breaker) on the unit's rear panel is set to the 1 ("on") position.
5. Press the **"POWER"** switch: the front panel vacuum fluorescent display (VFD) should read POWER ON, STATUS PK when power is applied.

   (NOTE: The Amplifier changes state each time the "POWER" switch is depressed—if the unit is on when the POWER switch is depressed, it will turn off; if the unit is off when the POWER switch is depressed, it will turn on.)
6. Adjust the gain by rotating the **"GAIN"** knob.
7. In the event of a Fault, press the **"RESET"** switch. If the problem persists, refer to Section 4.3 ("Troubleshooting") of this manual.

2.2.2 Remote Operation

2.2.1.1 Introduction

This subsection describes remote operation of the Model 50S1G4A amplifier by utilizing either the IEEE-488 parallel interface or the RS-232 serial interface and a controlling device, such as a bus controller or a personal computer (PC).

2.2.2.2 Selecting Remote Operation

The Model 50S1G4A can be placed in remote state at any time by switching the "**REMOTE/LOCAL**" switch on the front panel to the "**REMOTE**" position. In this mode, control is transferred to the selected remote interface and all the front panel controls are inoperative with the exception of the **REMOTE/LOCAL** switch. The amplifier's initial state will be **Power Off**, Minimum Gain. The front panel VFD will indicate **REMOTE** until the unit is returned to the local operation mode.

2.2.2.3 Interface Selection

The Model 50S1G4A can be controlled via either the IEEE-488 or RS-232 interfaces. Which interface is active is determined by the position of Switch 6 of the rear panel dual-in-line package (DIP) switch located between the two interface connectors. If Switch 6 is in the "on" (1) position, the active interface will be the RS-232. The "off" (0) position will activate the IEEE-488 interface.

2.2.2.4 Interface Set-up

Switches 1–5 of the rear panel DIP switch are used to select either the RS-232 communication (BAUD) rate or the IEEE-488 device address, depending upon which interface is active. (**NOTE:** These switches are only read at device power-up. In order for changes made in these switch settings to take place, AC power must be removed and then re-applied to the Model 50S1G4A.)

2.2.2.4.1 RS-232 BAUD rate selection

The serial communication (BAUD) rate can be set to five different levels. Selections are made by the positions of Switches 1–5 of the rear panel DIP switch. The following is a list of the available BAUD rates and the corresponding switch positions:

BAUD Rate	Switch on (1)
1200	1 only
2400	2 only
9600	3 only
19600	4 only
76800	5 only

(NOTE: Any other combination of switch settings will result in a BAUD rate equal to 1200.)

2.2.2.4.2 IEEE-488 device address selection

The IEEE-488 device address can be set to any number between 1 and 30. This selection is made by setting Switches 1–5 of the rear panel DIP switch to the binary equivalent of the number. **Table 2-1** illustrates this switch selection.

Table 2-1: IEEE-488 Device Address Selection

Device Address	Switch 5	Switch 4	Switch 3	Switch 2	Switch 1
1	off (0)	off (0)	off (0)	off (0)	on (1)
2	off (0)	off (0)	off (0)	on (1)	off (0)
3	off (0)	off (0)	off (0)	on (1)	on (1)
4	off (0)	off (0)	on (1)	off (0)	off (0)
5	off (0)	off (0)	on (1)	off (0)	on (1)
:					
:					
30	on (1)	on (1)	on (1)	on (1)	off (0)

2.2.2.5 Command Set Format

Each command is composed of one alpha character, up to four numeric parameters, and a command termination character. The command termination character is the "line feed" command, which is denoted and entered as <LF>. Commands are case-sensitive and must be entered in upper case only in order to be recognized.

2.2.2.6 IEEE-488 Communications

For IEEE-488 communications, the "End or Identify" (EOI) control line may also be used for command termination. When sending commands to the Model 50S1G4A via the IEEE-488 bus, terminate each command with a <LF>, an EOI, or both. No characters are permitted after the <LF> or EOI; the 50S1G4A interprets characters following the <LF> or EOI as the start of the next command. When an error condition is present at the Model 50S1G4A, the "Service Request" (SRQ) line is asserted. The operator can then perform a serial poll operation. The Model 50S1G4A error code (in binary) is contained in the returned serial poll status byte (STB). These error codes are defined in **Table 2-2**.

TABLE 2-2: REMOTE ERROR CODES/MESSAGES

IEEE-488 SERIAL POLL RESPONSE (STB) (binary)/decimal	MODEL 50S1G4A ERROR CONDITION	RS-232 ERROR MESSAGE
(01000001) 65	BAD COMMAND	E1
(01000010) 66	BAD PARAMETER	E2
(01000011) 67	INTERLOCK FAULT	E3
(01000100) 68	THERMAL FAULT	E4
(01000101) 69	POSITIVE 15 VOLT FAULT	E5
(01000110) 70	POSITIVE 16.5 VOLT FAULT	E6
(01000111) 71	NEGATIVE 5 VOLT FAULT	E7
(01001000) 72	NEGATIVE 15 VOLT FAULT	E8
(01001001) 73	AMP FAULT	E9
**********	TRANSMISSION ERROR	E10

2.2.2.7 RS-232 Communications

If RS-232 is the active interface, the Model 50S1G4A will test for a properly connected RS-232 interface when switched into remote mode. In order for the Model 50S1G4A to recognize an RS-232 connection, the "Data Carrier Detect" (DCD) line must be asserted. This line is sampled continuously to determine if the RS-232 connection is broken; therefore, it must remain asserted in order for the RS-232 interface to function. The "Clear To Send" (CTS) line is also used to gate information from the Model 50S1G4A. This line must be asserted in order to receive information from the Model 50S1G4A. The CTS line can be used as a "handshake" line to inform the Model 50S1G4A when it is permissible to send information. If the CTS line is de-asserted in the middle of a transmission, the character in the process of being transmitted will be completed and further transmission will halt until the CTS line is re-asserted. The Model 50S1G4A itself asserts two lines—"Data Terminal Ready" (DTR) and "Request To Send" (RTS). The DTR line is continuously asserted, while the RTS line is used to gate information into the Model 50S1G4A. Connector pin-out information is given in **Table 2-3**.

TABLE 2-3: RS-232 CONNECTOR PIN-OUTS

Pin No.	Signal	Data Direction*	Description
1	DCD	<	Device Carrier Detect
2	RD	<	Receive Data
3	TD	>	Transmit Data
4	DTR	>	Data Terminal Ready
5	GND	N/A	Ground
6	NC	N/A	No Connection
7	RTS	>	Ready To Send
8	CTS	<	Clear To Send
9	NC	N/A	No Connection

*Note:
> Output from Model 50S1G4A
< Input to Model 50S1G4A

Special Note: A null modem cable or adapter is required in order to properly interface the Model 50S1G4A to a standard serial port on a computer.

Once the RS-232 interface is established, commands are processed in the same manner as that of the IEEE-488 interface. The command structure is identical except that there is no EOI line. Therefore, all commands are terminated with a line feed (<LF>). Since this is a full-duplex asynchronous interface, if the Model 50S1G4A detects an error, the error message is immediately transmitted to the host controller. These error messages are defined in **Table 2-2.**

2.2.2.7.1 RS-232 port settings

The RS-232 port settings used for communication with the Model 50S1G4A are as follows.

Word Length:	8 bits
Stop Bits:	1
Baud Rate:	1200–76,800 (switch-selectable)
Parity:	None

2.2.2.8 Remote Commands

The following commands are available to the user for remote communication and operation of the Model 50S1G4A. In the descriptions of these commands, a lower-case "x" is used to signify a numeric value or parameter.

2.2.2.8.1 POWER ON/OFF

Controls the power on/off state of the Model 50S1G4A.

Syntax: Px

Parameters: 0 = power off

1 = power on

Example: To turn the power on, send the following command:

P1<LF>

2.2.2.8.2 GAIN

Sets the remote gain level of the Model 50S1G4A with 4095 steps of resolution.

Syntax: Gxxxx

Parameters: 0000 = maximum gain

:

:

4095 = minimum gain

Example: To set the Model 50S1G4A to minimum gain, send the following command:

G4095<LF>

2.2.2.8.3 RESET

Resets the Model 50S1G4A, clearing all Faults, if possible.

Syntax: R

Parameters: None

Example: To clear a Fault, send the following command:

R<LF>

SECTION III

THEORY OF OPERATION

3.1 INTRODUCTION

The Model 50S1G4A Microwave Amplifier consists of a 0.8–4.2 gigahertz (GHz) RF Amplifier located on the heat sinks and a Power Supply/Operate/Fault Circuit mounted on a chassis assembly located opposite the output heat sink. The RF Amplifier assemblies can be accessed through the top or bottom of the unit, and the Power Supply and Operate/Fault Circuits can be accessed through the bottom of the unit.

The RF Amplifier assembly consists of a Variable Gain Amplifier, a Splitter/Detector, a Linearizer/Control Circuit, a One (1)-watt Amplifier, a Bias Control Circuit, a driver stage, a Two-Way Splitter, two more driver stages, two Four-Way Splitters, eight output stages, and an Eight-Way Combiner.

The Power Supply section consists of an AC input filter, a circuit breaker, two switching power supplies, an Operate/Control Circuit, and a Regulator/Fault Circuit.

3.2 RF AMPLIFIER OPERATION

3.2.1 A1 Variable Gain Amplifier (Schematic No. 1012338—Part of Schematic No. 1012408)

The RF input signal is fed to the A1 Variable Gain Amplifier, RF Attenuator U1. U1 is a Gallium Arsenide (GaAs) Field-Effect Transistor (FET) Attenuator. DC signals between approximately -0.5V to -2.0V are used to control the shunt and series legs of the RF Attenuator. This Attenuator is used for manual gain control using the front panel "GAIN" control or for remote gain control, and to attenuate RF input signals above 0dBm, by utilizing internal voltages.

Inductor–Capacitor (LC) networks C2, L1, C3, and L2 form high-pass filters that are used to attenuate low-frequency signals.

Transistor Q1 is a GaAs FET and is the first stage of gain in the amplifier. Transistor A3Q1 in the A3 Linearizer Control Circuit controls the drain current through FET Q1. The output of Q1 is fed to the input of the Wilkinson Two-Way Splitter.

The Wilkinson Two-Way Splitter splits the signal into two paths. One output is fed to the input of the A4 One (1)-Watt Amplifier. The other output is fed to a detector that is terminated in 50Ω. The detected output is fed to the A3 Linearizer Control Circuit.

3.2.2 A3 Linearizer Control Circuit (Schematic No. 1012335—Part of Schematic No. 1012408)

Integrated circuit (IC) U1A provides a DC signal to the series element of the A1U1 Attenuator. The A1U1 has minimum attenuation when the control signal is at approximately -12.5V with maximum attenuation (minimum gain) occurring with 0V on the control input.

3.2.2 A3 Linearizer Control Circuit *(continued)*

NPN transistors Q2, Q3, and Q4 are used to provide break points in the series control voltage to the A1U1 RF Attenuator, thereby providing a more linear gain control/attenuation characteristic.

PNP transistor Q1 is used to control the drain current of GaAs FET A1Q1 by varying the A1Q1 gate voltage. A reference voltage is provided at the base of Q1 by voltage dividers R25 and R26. The drain current of the RF FET (A1Q1) flows through R27 (220Ω, 1 watt). PNP transistor Q1 varies the gate voltage to the RF FET A1Q1 to maintain the correct drain current.

IC U2A amplifies the signal from the A1CR1 detector diode. IC U2B is a comparator; its normal output is approximately -12.5V. When the RF input signal to the A1 Variable Gain Amplifier is increased above approximately 1mW (0dBm), the voltage output from U2B will become less negative. This voltage is fed to the "GAIN" control on the front panel of the amplifier. The wiper of the "GAIN" control is connected to the control input of U1A of the Linearizer/Control Circuit. The amplifier has maximum gain at approximately -12.5V control input; minimum gain occurs at 0V. The attenuation of A1U1 will increase as the output of A3U2B varies from -12.5V toward 0V. This will help to protect the unit in the event of input overdrive.

3.2.3 A4 One (1)-watt Amplifier (Schematic No. 1010591—Part of Schematic No. 1010749)

The A4 One (1)-watt Amplifier is assembled on a Teflon®/glass printed wiring board (PWB). It has three (3) GaAs FET gain stages. Each stage is input and output DC isolated by coupling capacitors. Resistive feedback is used from the drain to the gate of the GaAs FET to decrease the low-frequency gain. Shunt capacitive stubs are used to tune the amplifier. The drain of Q3 is matched to the output using a tapered transformer.

The GaAs FETs are operated in a depletion mode. They will conduct the maximum DC current with 0V bias on their gates and are normally operated with approximately -1V to -4V on their gates.

3.2.4 A5 Bias Control Circuit (Schematic No. 1010902—Part of Schematic No. 1010749)

The Bias Control Circuit controls the DC drain current of the three (3) FET stages in the A4 One (1)-watt Amplifier by varying the gate voltage of the RF stages. The Bias Control Circuit has a -5V input and a +16.5V input from the power supply.

All of the Bias Control Circuit stages operate in a similar manner; therefore, only the operation of the Q4 stage is described herein.

PNP transistor Q4 (2N3906) is used to control the DC current through the A4Q3 FET in the A4 One (1)-watt Amplifier. A reference voltage of 9.5V is established on the base of Q4 with the voltage divider network R7 (2.2K) and R12 (3.0K). There is a 18Ω resistor from the 16.5V line to the emitter of Q4 and also to the drain of A4Q4 in the A4 One (1)-watt Amplifier. Q4 will operate normally with approximately 8.4V on the emitter; this will occur with approximately 370mA through the 18Ω resistor R8. If the current through A4Q3 decreases, the drop across R8 will decrease, thereby increasing the emitter voltage of Q4; this will cause Q4 to conduct more, which will cause the gate voltage of A4Q3 to become more positive, which will cause A4Q3 to conduct more, thereby returning the voltage at the emitter of Q4 to 10.2V.

3.2.5 A6, A8, A9, A12, A13, A14, A15, A16, A17, A18, and A19 Quadrature-Coupled Amplifiers ("Quad Amps") (Schematic No. 1009163)

IC U1 is a voltage regulator set to 13.5V output with a current limit of approximately 2.2 amps. Q1 turns off the voltage regulator when the -5V supply voltage falls below approximately -3.5V. PNP transistors Q2 and Q5 regulate the DC current through Q3 and Q4, respectively, by sensing the voltage drop across 2.7Ω resistors R5 and R16 and varying the negative voltage on the gates of Q3 and Q4, thereby maintaining the drain current at

approximately 1 amp. The DC operation of Q3 and Q4 can be checked on test points TP1 and TP2 without removing the unit's lid. The normal voltage on TP1 and TP2 without RF drive is 10.9 ±0.4V.

U2 and U3 are 90° quadrature couplers. U2 splits the input signal into two signals with a phase difference of 90°. U3 combines the RF outputs from Q3 and Q4 and is connected to the output connector J2. 50Ω termination resistors R17 and R18 absorb any difference signals and help to improve the input and output VSWR of the module. The module has a gain of 7.5dB or greater and delivers approximately 8 watts of RF power.

3.2.6 A7 Two-Way Splitter

A7 is a multi-section, broadband Wilkinson splitter. The input signal is split into two equal amplitude, in-phase signals. The amplitude of each signal is 3–3.5dB below the input signal when terminated in 50Ω loads.

3.2.7 A10, A11 Splitters

A10 and A11 are multi-section, multi-stage, broadband Wilkinson splitters. Each input signal is split into four equal amplitude, in-phase signals. The amplitude of each output signal should be 6–7dB below the input signal when they are terminated in 50Ω.

3.2.8 A20 Combiner

A20 is an Eight-Way Radial Combiner with impedance matching. The outputs of the A12, A13, A14, A15, A16, A17, A18, and A19 amplifiers are combined in A20 to yield a total power output approximately 9dB above the output of a single amplifier. The output of A20 is connected to the output connector of the Model 50S1G4A.

3.3 POWER SUPPLY ASSEMBLY (Schematic No. 1010552)

The Power Supply Assembly consists of three switching power supplies—PS1, PS2, and PS3. These power supplies have a regulated output and auto-ranging on the input to automatically select the correct connections for the line voltage in use, either 90–132 or 180–264VAC, 50/60Hz.

PS1 is a triple-output power supply that provides +5V, +12V and –12V to power the Operate/Control Board. PS2 is also a triple-output power supply that provides +16.5V to the EFT drain supplies in the One (1)-Watt, Four (4)-Watt and Quadrature-Coupled amplifiers. PS2 also provides +24V and –24V. The +24V power supply powers the cooling fans; it is also regulated to +15V to operate the A3 Linearizer Control Board; it is also regulated to –5V to provide bias for the GaAs FETs in the One (1)-Watt, Four (4)-Watt and Quadrature-Coupled amplifiers. Relay K1 switches the AC input power to PS2 for local and remote amplifier operation. Fans B1, B2 and B3 supply air flow to cool the heat sink and the power supplies.

3.3.1 A21 Operate/Control Board (Schematic No. 1008597)

The A21 Operate/Control Board is a microcontroller-based printed wiring board (PWB) assembly that allows sensing and control of internal signals as well as remote personal computer (PC) control via on-board RS-232 and IEEE-488 data communications ports. The Operate/Control Board utilizes a state-of-the-art, Reduced Instruction Set Computing (RISC) microcontroller that can quickly and reliably perform all front panel control and monitoring tasks, thereby allowing real-time control of the Model 50S1G4A via either remote bus. Besides being reported remotely, all amplifier Faults are continuously monitored and indicated via the front panel VFD.

3.3.2 A22 Regulator/Control Board (Schematic No. 1009511)

The A15 Regulator/Control Board is comprised of DC regulators, comparators, and relays.

3.3.2.1 Relays K1, K2 and K3 are energized by the A14 Operate Control Board whenever the Model 50S1G4A is turned on, either locally or remotely. When energized, these relays supply DC power to ICs U1, U3 and U6 and Relay K1 in the Power Supply Assembly.

3.3.2.2 IC U1 supplies +15V to the A3 Linearizer Control Circuit. IC U6 supplies –15V to the A3 Linearizer Control Circuit. IC U3 supplies –5V to all of the Quad Amps, the A4 One (1)-Watt Amplifier, and the A6 Four (4)-Watt Amplifier.

SECTION IV

MAINTENANCE

4.1 GENERAL MAINTENANCE INFORMATION

The Model 50S1G4A is a relatively simple instrument that should require very little maintenance. It is built with printed wiring boards (PWBs) and solid state components in order to ensure long, trouble-free life. However, should a malfunction occur, special care must be taken when servicing the unit in order to avoid damage to the solid state components or the PWBs.

Since the unit's solid state components are soldered in place, substitution of components should not be resorted to unless there is some indication that they are faulty. In addition, when troubleshooting, care must be taken to avoid shorting amplifier voltages. Small bias changes may cause excessive dissipation or transients that could ruin the amplifier.

All components utilized in Amplifier Research instruments are conservatively operated to ensure maximum instrument reliability. Despite this, parts within an instrument may fail. In most cases, the instrument may be repaired immediately with a minimum of "down time." A systematic approach to troubleshooting can greatly simplify and thereby speed up the required repairs.

However, due to the critical importance of maintaining the amplifier's alignment, it is recommended that the unit be returned to the factory for part replacement and amplifier realignment when failure is caused by a breakdown of any of the components in the RF signal circuits. Shipping instructions are as follows.

Please ship the unit PREPAID via United Parcel Service (UPS) to:

Amplifier Research Corporation
160 School House Road
Souderton, PA 18964-9990

4.2 DISASSEMBLY PROCEDURE

⚠ **CAUTION:**

EXTREME CAUTION SHOULD BE EXERCISED WHEN TROUBLESHOOTING THIS UNIT, PARTICULARLY WHEN MEASURING VOLTAGES IN THE POWER SUPPLY SECTION, SINCE HAZARDOUS VOLTAGES EXIST IN THE UNIT THAT COULD CAUSE SERIOUS INJURY TO ANY PERSONNEL PERFORMING THE MEASUREMENTS.

The amplifier can be removed from its housing by removing four (4) screws from the front panel and four (4) screws from the back panel. The amplifier can then be slid from its housing. The top cover can be removed to gain access to the RF assemblies; the bottom cover can be removed to gain access to the power supplies.

4.3 Troubleshooting

⚠ CAUTION:

THE MICROWAVE TRANSISTORS USED IN THE MODEL 50S1G4A AMPLIFIER ARE GaAs FETs. THESE DEVICES ARE VERY RELIABLE WHEN INSTALLED IN A SUITABLE CIRCUIT, BUT THEY CAN BE EASILY DAMAGED BY IMPROPER TROUBLESHOOTING OR HANDLING TECHNIQUES. THE GATE JUNCTIONS OF THE GaAs FETs HAVE A HIGH INPUT IMPEDANCE AND ARE SUSCEPTIBLE TO STATIC DAMAGE OR DAMAGE DUE TO THE USE OF AN UNGROUNDED SOLDERING IRON. DO NOT TRY TO CHECK THE GaAs FETs WITH AN OHMMETER. USE CAUTION WHEN TROUBLESHOOTING THE GaAs FETs; DO NOT SHORT THE GATE TO THE GROUND OR TO THE DRAIN.

⚠ CAUTION:

USE CARE WHEN UNPACKING NEW GaAs FETs. THE GaAs FET PACKAGING SHOULD ONLY BE OPENED AT ELECTROSTATIC DISCHARGE (ESD)-APPROVED WORKSTATIONS, BY INDIVIDUALS WHO ARE FAMILIAR WITH THE HANDLING OF MICROWAVE GaAs FETs AND OTHER ESD-SENSITIVE DEVICES.

Troubleshooting the Model 50S1G4A in a logical manner can speed the solution to a problem. The settings of potentiometers ("pots"), capacitors ("caps"), or other variables should not be disturbed until other problems have been eliminated. Comparing the measured DC voltages to those shown on the schematics can solve many problems. Before measuring circuit voltages, first verify that the voltages to the circuits are correct.

Model 50S1G4A Troubleshooting Categories:

Subsection 4.3.1—**"Power On"** Indication Doesn't Display on Front Panel when **POWER** Switch is Depressed

Subsection 4.3.2—The Unit Cannot be Operated Remotely

Subsection 4.3.3—Thermal Fault

Subsection 4.3.4—Interlock Fault

Subsection 4.3.5—Voltage Faults

Subsection 4.3.6—Low or No Power Output (DC Tests)

Subsection 4.3.7—Low or No Power Output (RF Tests)

4.3 Troubleshooting *(continued)*

4.3.1 "Power On" Indication Doesn't Display on Front Panel when POWER Switch is Depressed (Schematic No. 1009506)

4.3.1.1 If the Model 50S1G4A is operating in an otherwise normal fashion, the front panel display or the wiring to it could be defective.

4.3.1.2 Check the **LOCAL/REMOTE** switch on the unit's front panel; it must be set to the **LOCAL** position in order to operate the front panel **POWER** switch. Check the circuit breaker on the unit's rear panel; it must be set to the "**I**" ("ON") position.

4.3.1.3 If the **"Power On"** indication is not displayed and the cooling fans (Blowers B1, B2, B3) are not running, check to see that the unit is plugged into a live outlet and that the AC line cord is plugged securely into the unit.

4.3.1.4 Check the output voltages from PS1; these voltages should be as follows:

PS1 J2, Pin 1	+12.0 ± 0.3VDC
PS1 J2, Pin 2	+ 5.0 ± 0.2VDC
PS1 J2, Pin 6	-12.0 ± 0.3VDC

4.3.1.5 If output voltages are not present on PS1, check the AC input to PS1.

4.3.1.6 Check the voltages to the A21 Operate/Control Board on connector A21 J1; the voltages should be as follows:

A14 J1, Pin 16	-12.0 ± 0.3VDC
A14 J1, Pin 29	+ 5.0 ± 0.2VDC
A14 J1, Pin 31	+12.0 ± 0.3VDC

4.3.1.7 Check the voltage on A21 J1, Pin 6; it should be ≥4V when the **POWER** switch (S1) is in the normal position and <0.1V when S1 is depressed. S1 is normally open; it is closed only when it is depressed. The amplifier should change state every time the **POWER** switch is depressed.

4.3.1.8 If all voltages are correct and the unit still does not operate, contact Amplifier Research to arrange for repair or replacement of the A21 Operate/Control Board.

4.3.2 The Unit Cannot be Operated Remotely

4.3.2.1 Verify that the front panel **LOCAL/REMOTE** switch is set to the **REMOTE** position.

4.3.2.2 Verify that the unit operates locally by resetting the **LOCAL/REMOTE** switch to the **LOCAL** position; if the unit does not operate locally, see subsection **4.3.1** of this manual.

4.3 Troubleshooting *(continued)*

4.3.2 The Unit Cannot be Operated Remotely *(continued)*

4.3.2.3 Check the position of the **"ADDRESS"** switch assembly (SW1) on the A21 Operate/Control Board; this assembly can be accessed through the unit's rear panel. Check to see that these switches are properly set for either RS-232 or IEEE-488 operation, as desired. (See subsection **2.2.2** of this manual for the proper **"ADDRESS"** switch settings.) (**Note:** Address switches are only read at unit power-up; remove and re-apply AC power (i.e., reset the circuit breaker) after changes are made.)

4.3.3 Thermal Fault (Schematic No 1010522)

During a Thermal Fault, the front panel display should read **"Thermal Fault."**

4.3.3.1 Try to reset the unit; if the unit resets and operates normally, check to see that the cooling fans (B1, B2, B3) are operating normally and that the air inlet on the bottom of the unit and the air outlets on the rear of the unit are not blocked.

4.3.3.2 If the unit does not reset and the cooling fans are operating normally, check the voltage at the A21 Operate/Control Board, J1, Pin 4; it should be ≤0.1V.

4.3.3.3 If the voltage on A21 J1, Pin 4 is high, check the thermal daisy chain through S2 and S1, S3, S4 to ground.

4.3.4 Interlock Fault (Schematic No. 1010552)

The Model 50S1G4A is equipped with an interlock connector, which is located on the rear panel. The interlock circuit can be used to sense the openings of doors to screen rooms, test chambers, and so forth, and to turn off RF energy when these doors are opened.

Note: The Model 50S1G4A is shipped with a mating connector, which has a jumper between Pins 1 and 8, installed in the rear panel interlock connector. The unit will not operate unless the interlock circuit is closed.

4.3.4.1 In the event of an Interlock Fault, the front panel display should read **"INTERLOCK FAULT."**

4.3.4.2 Check to see if it is safe to be power up the unit—are there personnel present in the screen room, or are doors to the screen room open?

4.3.4.3 After checking for safety, try to clear the Interlock Fault from the front panel by using the **RESET** switch.

4.3.4.4 If the Interlock Fault will not clear, check for continuity in the External Interlock Circuit (Pin 1 to Pin 8 in the connector, which mate with J2 in the rear panel).

4.3 Troubleshooting *(continued)*

4.3.4 Interlock Fault (Schematic No. 1010552) *(continued)*

4.3.4.5 Check the voltage on A22 J1, Pin 18; it should be ≥4.0V.

4.3.4.6 Check the voltage on A21 J1, Pin 20; it should be ≥4.0V.

4.3.4.7 If all of the above voltages are correct and the unit still will not reset, check for defective wiring and/or PWB connections, then try the **RESET** switch again. If the unit still will not reset, the A21 Operate/Control Board is defective. Contact Amplifier Research to arrange for repair or replacement of the A21 Operate/Control Board.

4.3.5 Voltage Faults (Schematic Nos. 1010552 and 1009511)

The Model 50S1G4A's fault circuits sense four voltage faults: **-5V, -15V, +15V, and +16.5V**. The -5V and -15V fault circuits are located on the A22 Regulator Control Board. The +15V and +16.5V fault circuits are located on the A21 Operate/Control Board.

4.3.5.1 -5V Faults: -5V faults are sensed by a fault circuit on the A22 Regulator/Control Board.

4.3.5.2 A22 U5B is a comparator that is used to sense -5V faults. This comparator's output is usually low.

4.3.5.3 The output of A22 U5B should go high if the -5V power supply ≤ 3.8V.

4.3.5.4 The output of A22 U5B is fed to the A21 Operate/Control Board via A21 J1, Pin 25.

4.3.5.5 If the output of A22 U5B is low and the -5V fault cannot be cleared, and the amplifier cannot be reset, then the A21 Operate/Control Board is defective. Contact Amplifier Research to arrange for repair or replacement of the A21 Operate/Control Board.

4.3.5.6 -15V Faults: -15V faults are sensed by a fault circuit on the A22 Regulator/Control Board.

4.3.5.7 A22 U5A is a comparator that is used to sense -15V faults. This comparator's output is usually low.

4.3.5.8 The output of A22 U5A should go high if the-15V power supply is ≤-12.2V.

4.3.5.9 The output of A22 U5A is fed to the A14 Operate/Control Board via A21 J1, Pin 40.

4.3.5.10 If the output of A22 U5A is low and the -15V fault cannot be cleared, and the amplifier cannot be reset, then the A21 Operate/Control Board is defective. Contact Amplifier Research to arrange for repair or replacement of the A21 Operate/Control Board.

4.3 Troubleshooting *(continued)*

4.3.5 Voltage Faults (Schematic Nos. 1010552 and 1009511) *(continued)*

4.3.5.11 +15V Faults: +15V faults are sensed by a fault circuit on the A21 Operate/Control Board.

4.3.5.12 If there is a +15V fault that cannot be cleared, check the voltage at A21 J1, Pin 9. If the voltage is >12.7V and the fault will not clear, check the adjustment of R22 on the A21 Operate/Control Board. If the problem cannot be corrected by adjusting R22, then the Operate/Control Board is defective. Contact Amplifier Research to arrange for repair or replacement of the A21 Operate/Control Board.

4.3.5.13 +16.5V Faults: +16.5V faults are detected by a fault circuit on the A21 Operate/Control Board.

4.3.5.14 If there is a +16.5V fault that cannot be cleared, check the voltage on A21 J1, Pin 10. If the voltage is >12.7V and the fault will not clear, check the adjustment of R23 on the Operate/Control Board.

4.3.5.15 If the voltage on A21 J1, Pin 10 is normal (>12.7V) and the fault cannot be cleared by adjusting R23, then the A21 Operate/Control Board is defective. Contact Amplifier Research to arrange for repair or replacement of the A21 Operate/Control Board.

4.3.6 Low or No Power Output (DC Tests) (Schematic No. 1010552)

All indicators on the Model 50S1G4A are normal, the front panel display reads **"Power On,"** and the cooling fans (Blowers B1 and B2, B3) are operating.

4.3.6.1 Check the position of the RF Gain control—is it set to maximum gain?

4.3.6.2 Check the RF input to the unit—is it the correct amplitude and frequency?

4.3.6.3 Check the RF output connection from the unit—is it correctly connected to the load? Is the coaxial cable okay?

4.3.6.4 Check the voltages on Connector J1 of the A3 Linearizer Control Circuit. Troubleshoot any incorrect voltages.

A3 J1, Pin 4 -15 ± 0.4V
A3 J1, Pin 5 15 ± 0.4V
A3 J1, Pin 6 -12.5 ± 1.5V (RF Gain control at maximum gain, input signal <-5dBm).

4.3 Troubleshooting *(continued)*

4.3.6 Low or No Power Output (DC Tests) (Schematic No. 1010552) *(continued)*

4.3.6.5 Check the voltages on the feed-through capacitors of the A1 Variable Gain Amplifier with the RF Gain control set for maximum gain. Troubleshoot any incorrect voltages.

A1 C12	-0.7 to -3.5V
A1 C13	4.3 ± 0.5V
A1 C11	-0.1 ± 0.05V
A1 C10	-1.5 ± 0.5V
A1 C9	-4.0 ± 1.0V

4.3.6.6 Check the voltages supplied to the A5 Bias Control Board. Troubleshoot any incorrect voltages.

A5, Pin 3	16.5 ± 0.5V
A5, Pin 1	-5 ± 0.4V

4.3.6.7 Check the voltages on the feed-through capacitors of the A4 One (1)-Watt Amplifier. Troubleshoot any incorrect voltages.

C3, C5, C7	-0.7 to -3.5V
A4 C4	7.6 ± 0.5V
A4 C6	10.2 ± 0.5V
A4 C8	10.2 ± 0.5V

4.3.6.8 Check the voltage on TP1 on the A6 Four (4)-Watt Amplifier; the voltage should be 10.4 ± 0.3V. If the voltage on TP1 is low, check the voltages on C1 and C4 of that amplifier.

4.3.6.9 Check the voltages on TP1 (C21) and TP2 (C22) on the A6, A8, A9, A12, A13, A14, A15, A16, A17, A18 and A19 Quadrature-Coupled Amplifiers ("Quad Amps"); the voltage should be 10.4 ± 0.3V. If any of the voltages on TP1 and TP2 are low, check the voltages on C1 and C4 of that amplifier.

TP1, TP2	10.9 ± 0.3V
C1	16.5 ± 0.3V
C4	-5 ± 0.3V

4.3.7 Low or No Power Output (RF Test) (Schematic No. 1010552)

Note: The DC Tests specified in subsections **4.3.6.1–4.3.6.8** should be completed before conducting the RF tests specified in the following subsections.

Phase matching must be maintained from the output of the A7 Two-Way Splitter to the input of the A20 Eight-Way Combiner; if coaxial cables are removed, they must be reinstalled in the same locations from which they were removed. Replacement coaxial cable assemblies must be the same lengths as the original ones.

4.3.6.2 Check the RF input to the unit—is it the correct amplitude and frequency?

4.3.6.3 Check the RF output connection from the unit—is it correctly connected to the load? Is the coaxial cable okay? Check the DC voltages at the following points:

4.3.6.4 Check the voltages on Connector J1 of the A3 Linearizer Control Circuit. Troubleshoot any incorrect voltages.

A3 J1, Pin 4	-15 ± 0.4V
A3 J1, Pin 5	15 ± 0.4V
A3 J1, Pin 6	-12.5 ± 1.5V ("GAIN" control at maximum gain. Input signal <-5dBm).

4.3.6.5 Check the voltages on the feed-through caps of the A1 Variable Gain Amplifier with the RF Gain control set for maximum gain. Troubleshoot any incorrect voltages.

A1 C12	-0.7 to -3.5V
A1 C13	4.3 ± 0.5V
A1 C11	-0.1 ± 0.05V
A1 C10	-1.5 ± 0.5V
A1 C9	-4.0 ± 1.0V

4.3.6.6 Check the voltages supplied to the A5 Bias Control Board. Troubleshoot any incorrect voltages.

A5, Pin 3	+16.5 ± 0.5V
A5, Pin 1	-5 ± 0.4V

4.3.6.7 Check the voltages on the feed-through caps of the A4 One (1)-watt Amplifier. Troubleshoot any incorrect voltages.

C3, C5, C7	-0.7 to -3.5V
A4 C4	7.6 ± 0.5V
A4 C6	10.2 ± 0.5V
A4 C8	10.2 ± 0.5V

4.3.6.8 Check the voltages on TP1 (C21) and TP2 (C22) on the A6, A8, A9, A12, A13, A14, A15, A16, A17, A18, and A19 Quadrature-Coupled Amplifiers ("Quad Amps"). The voltage should be 10.4 ± 0.3V. If any of the voltages on TP1 and TP2 are low, check the voltages on C1 and C4 of that amplifier.

TP1, TP2	10.9 ± 0.3V
C1	16.5 ± 0.3V
C4	-5 ± 0.3V

4.3.7 Low or No Power Output (RF Test) (Schematic No. 1010552)

NOTE: The DC Tests specified in Paragraphs 4.3.6–4.3.6.8 should be completed before conducting the RF tests specified in the following paragraphs.

Phase matching must be maintained from the output of the A7 Two-Way Splitter to the input of the A20 Eight-Way Combiner; if coaxial cables are removed, they must be reinstalled in the same location from which they were removed. Replacement coaxial cable assemblies must be the same lengths as the original ones.

4.3.7.1 The Model 50S1G4A's typical Gain Response is shown in **Figure 4.3.7.1.** The actual gain may vary considerably from that shown in Figure 4.3.7.1, but it should be ≥48dB.

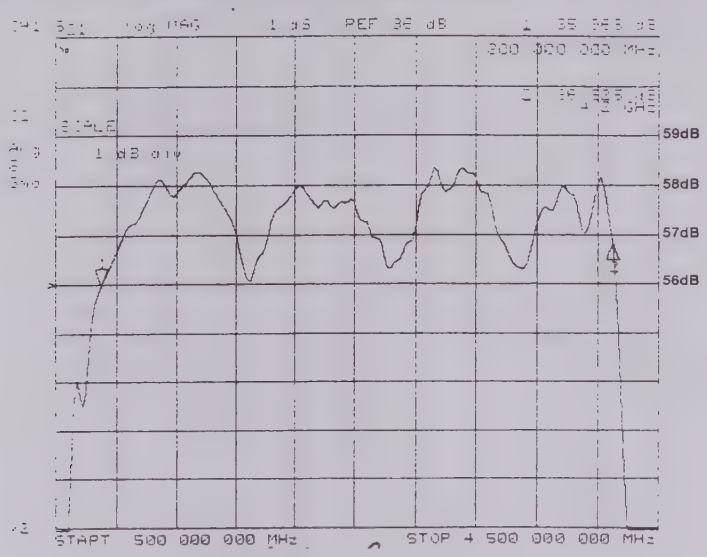


Figure 4.3.7.1
Typical Gain Response

NOTE: If the overall gain is low, the amplifier chain can be separated at the input to the A7 Two-Way Splitter and the gain checked from the input to the A7 Two-Way Splitter to the "OUTPUT" connector on the unit's front panel.

4.3.7.2 Remove the coaxial cable from the output of the A6 Quad Amp to the input of the A7 Two-Way Splitter. The typical response from the input of the A7 Two-Way Splitter to the "OUTPUT" connector on the unit's front panel is shown in **Figure 4.3.7.2.**

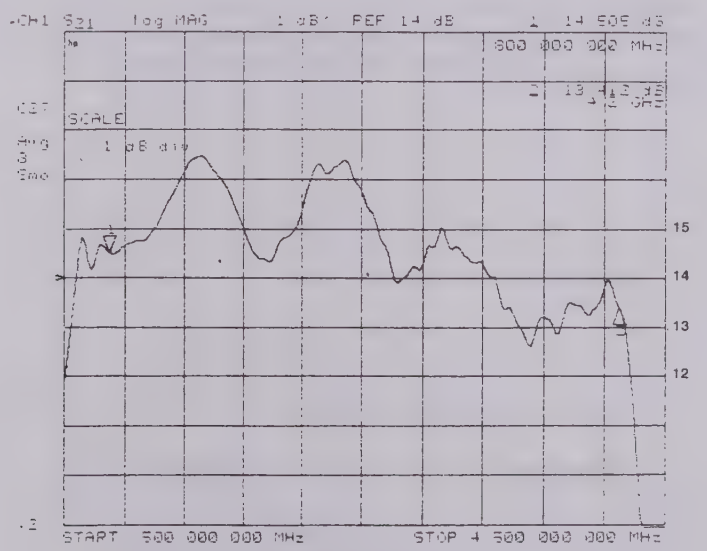


Figure 4.3.7.2
Typical Response: Input A7–Output Front Panel

If the response is normal, see **Paragraph 4.3.7.8**. If the response is abnormal, perform the following tests.

4.3.7.3 If the gain is slightly low (i.e., several dB below typical), try disconnecting the inputs from the A12, A13, A14, A15, A16, A17, A18, and A19 Quad Amps one at a time, then reconnect them. Note the difference in response when disconnecting the Quad Amps; if any Quad Amp causes less of a change in gain than the others, check the Quad Amp, coaxial cable, and so forth associated with that Quad Amp. Typical Quad Amp Response is shown in **Figure 4.3.7.3.**

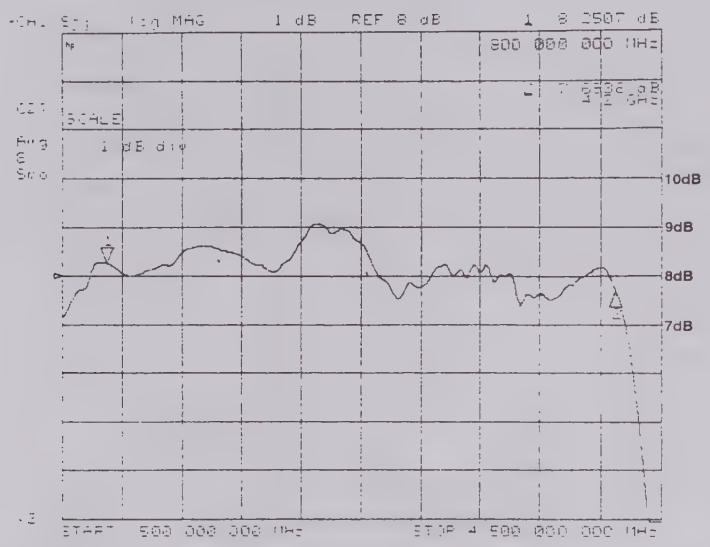


Figure 4.3.7.3
Typical Quad Amp Response

4.3.7.4 If the gain is 5dB or more below the typical response, do the following:

- Disconnect the coaxial cable from the input of the A8 Quad Amp, and note the results.
- Reconnect the coaxial cable from the input of A8 and disconnect the coaxial cable from the input of the A9 Quad Amp; the results should be similar. If not, check the side that made the least difference. Check the Two-Way Splitter, the Four-Way Splitter, the Quad Amp, and so forth.

4.3.7.5 A typical Two-Way Splitter Insertion Loss is shown in Figure 4.3.7.5. The unused port must be terminated when checking the insertion loss.

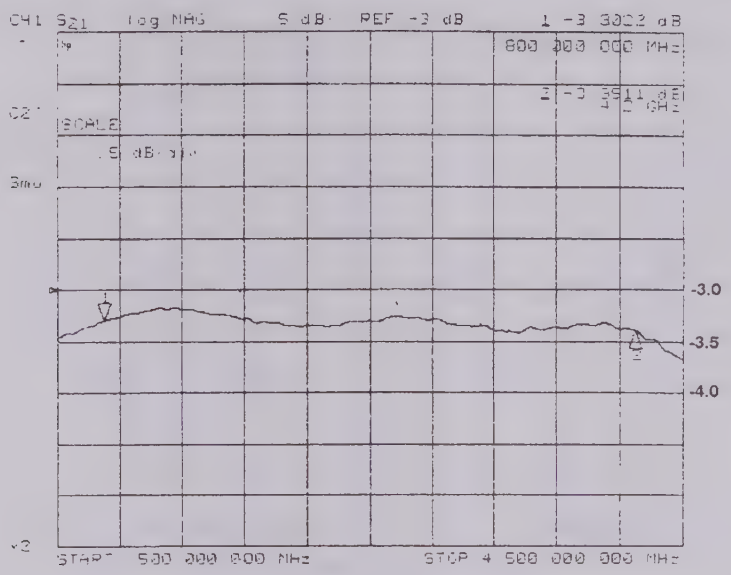


Figure 4.3.7.5
Typical Two-Way Splitter Insertion Loss

4.3.7.6 A typical Four-Way Splitter Insertion Loss is shown in **Figure 4.3.7.6.** The unused port must be terminated when checking the insertion loss.

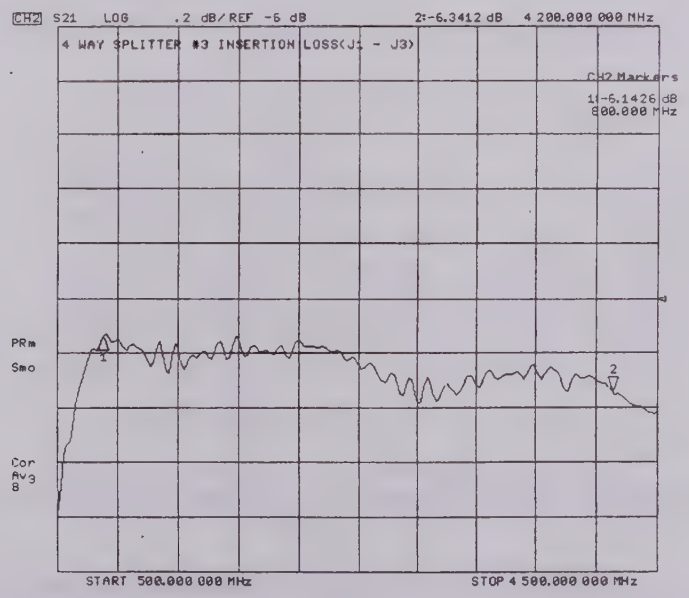


Figure 4.3.7.6
Typical Four-Way Splitter Insertion Loss

4.3.7.7 A typical Eight-Way Combiner Insertion Loss and Combined Port Return Loss is shown in **Figure 4.3.7.7.** The unused port must be terminated when checking the Insertion Loss.

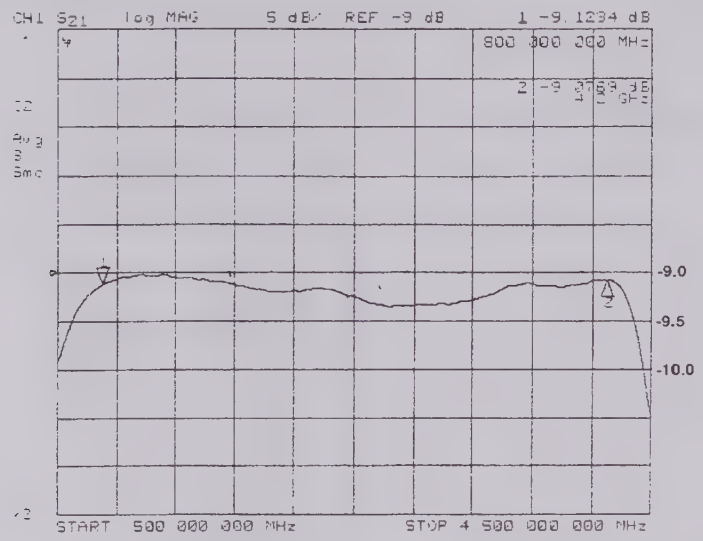


Figure 4.3.7.7
Typical Eight-Way Combiner Insertion Loss

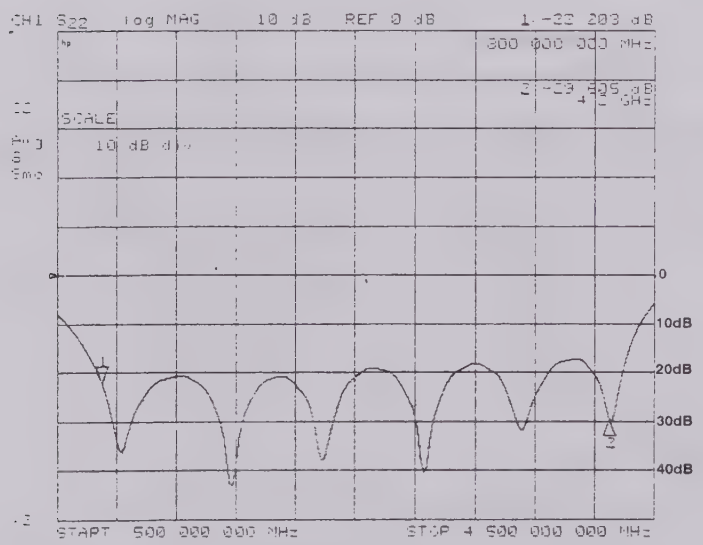


Figure 4.3.7.7
Typical Eight-Way Combiner Return Loss: Combined Output Port

NOTE: The Return Loss of the Eight-Way Combiner's combined output port is typically better than 17dB (see Figure 4.3.7.7). The Return Loss of the Eight-Way Combiner's eight input ports is approximately 2dB when one port is driven.

4.3.7.8 If the response of the output stages (A7 Two-Way Splitter input to front panel "OUTPUT") is normal, check the response of the A6 Quad Amp (see **Figure 4.3.7.8**).

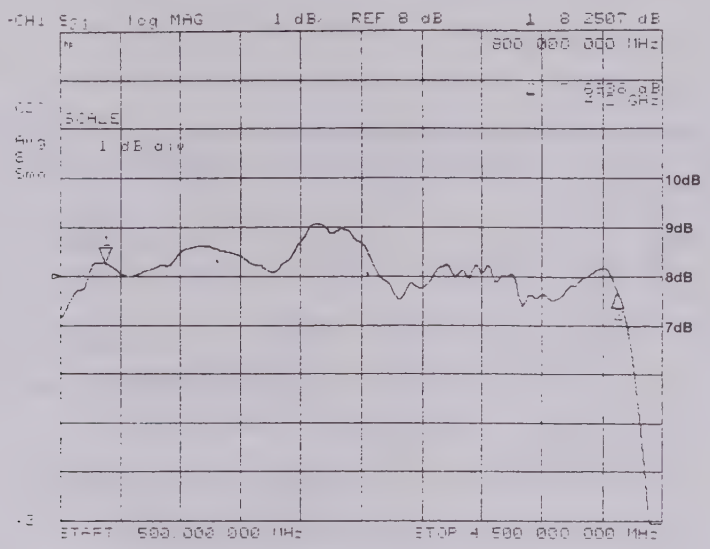


Figure 4.3.7.8
Typical Quad Amp Response

NOTE: The A4 One (1)-watt Amplifier's response or the A1 Variable Gain Amplifier's response may differ considerably—particularly in flatness—from the typical responses shown in the following Figures (4.3.7.9 and 4.3.7.10).

4.3.7.9 The typical response for the A4 One (1)-watt Amplifier is shown in **Figure 4.3.7.9.**

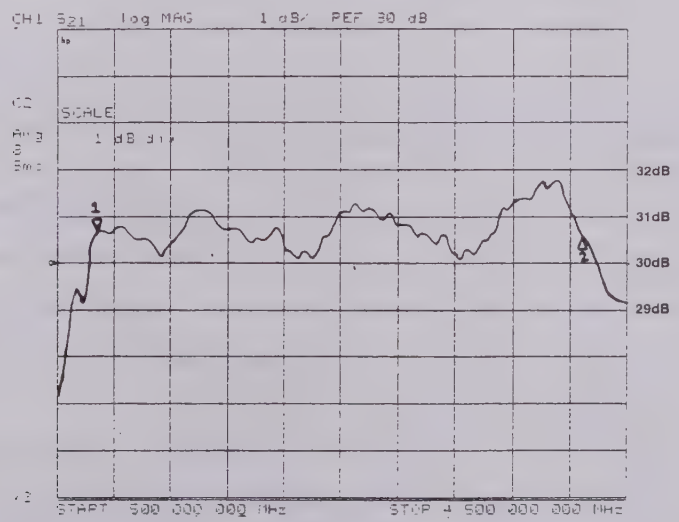


Figure 4.3.7.9
Typical A4 One (1)-Watt Amplifier Response

4.3.7.10 The typical response for the A1 Variable Gain Amplifier (at maximum gain setting) is shown in **Figure 4.3.7.10.**

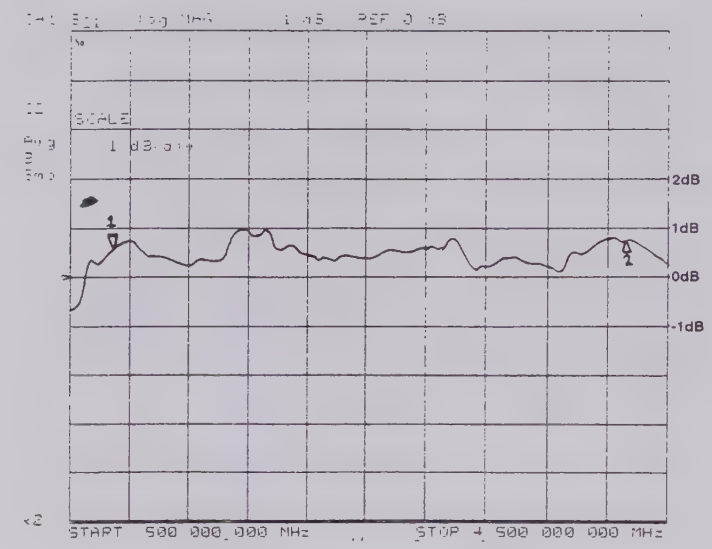


Figure 4.3.7.10
Typical A1 Variable Gain Amplifier Response

SECTION V

REPLACEABLE PARTS

5.1 INTRODUCTION

This section contains information for ordering replacement parts. Information is provided for obtaining parts through Amplifier Research and/or from the manufacturer of the part. Included in this section are the following:

- Ordering Information
- Non-Listed Parts
- Circuit Designators
- Manufacturers' Abbreviation Listing
- Master List
- Schematics and Bills of Material (BOMs)

5.2 ORDERING INFORMATION

To obtain replacement parts, address your order to Amplifier Research, 160 School House Road, Souderton, PA 18964-9990 USA. Please include the instrument's Model Number and Serial Number.

TEL: 215 723-8181

TWX: 510 661-6094

FAX: 215 723-5688

5.3 NON-LISTED PARTS

To obtain a part that is not listed in this section, please include the following information with your order:

a. Instrument Model Number

b. Instrument Serial Number

c. Description of the Part

d. Function and Location of the Part

5.4 CIRCUIT DESIGNATORS

REF = Reference Document

A = Assembly

B = Fan

BT = Battery

C = Capacitor

5.4 CIRCUIT DESIGNATORS *(CONTINUED)*

CB = Circuit Breaker

CR = Diode

DL = Delay Line

DS = Lamp

E = Terminal

F = Fuse

F = Filter

J = Connector, Recept.

K = Relay

L = Inductor

M = Meter

P = Connector, Plug

Q = Transistor, Semiconductor

R = Resistor, Potentiometer

RT = Temperature-Sensing Element

S = Switch

T = Transformer

TB = Terminal Block

TP = Test Point

U = Integrated Circuit

V = Vacuum Tube, Neon Bulb, Photocell, etc.

VR = Zener Diode

W = Wire, Cable

X = Socket

Y = Crystal Unit

5.5 MANUFACTURERS' ABBREVIATION LISTING

This section contains a list of manufacturers' abbreviations. These abbreviations appear under the "Drawing Number" column on the Bills of Material (BOMs). The three letters or symbols before the backward slash represent the name of the manufacturer. The number after the backward slash represents the manufacturer's part number. See **Appendix A** (at the end of this section) for a complete listing of manufacturers' abbreviations.

5.6 MASTER LIST

The Master List provides the user with a quick view of the major assemblies of a unit. The assemblies are displayed in an indented format, with the corresponding schematic shown in the right column.

5.7 SCHEMATICS AND BILLS OF MATERIAL (BOMS)

The schematics and BOMs are arranged in sequence according to the Master List. The schematic that appears first on the Master List also appears first in the schematic and BOM section. Following each schematic are the appropriate BOMs relating to the schematic. This pattern is repeated throughout this section.

The BOMs used in this manual are computer-generated. Each computer part number appears only once on a BOM, along with the total quantity used and all of the applicable circuit designators. The BOMs are designed to organize the parts in alphanumeric order of their circuit designators. Typical manufacturer part numbers can be found in the drawing number column. The manufacturer's abbreviation appears first, separated by a backward slash, which is followed by the part number.

Amplifier Research has assigned computer product numbers to all parts in inventory. The computer product numbers are located on the left side of the BOM in the "Part Number" field. When referencing or ordering parts from Amplifier Research, it is best to use the computer product number. Parts may also be ordered directly from the manufacturer by using the manufacturer's part number, if desired.

AAV ..... AAVID
ABB ..... ABBEON
ACA ..... ANTENNA CORPORATION OF AMERICA
ACO ..... ARCO
ADA ..... ADALET
AND ..... ASTRO DYNE
AEC ..... ARNOLD ENGINEERING COMPANY
AEP ..... APPLIED ENGINEERING PRODUCTS
AER ..... AEROQUIP
AEX ..... AEROVOX
AHC ..... AIRLINE HYDRAULICS CORPORATION
AIN ..... AIN PLASTICS
AIR ..... AIRPAX
AIT ..... AERITALIA
AJO ..... A. J. OSTER FOILS INCORPORATED
ALC ..... ALCO
ALE ..... ALLIED ELECTRONICS
ALI ..... ASTROLAB INCORPORATED
ALP ..... ALPHA
AMA ..... AMATOM
AMC ..... AMPEX CORPORATION
AMH ..... AMPHENOL
AMI ..... AMPLIFONIX INCORPORATED
AMO ..... AMPRO
AMP ..... AMP INCORPORATED
AMR ..... AMREP
AMS ..... AMERICAN STANDARD
AND ..... ANALOG DEVICES
ANZ ..... ANZAC
APG ..... AP-O-GEE INDUSTRUES
APN ..... AMERICAN PRECISION
APO ..... AMPROBE
APP ..... A. P. PRODUCTS INCORPORATED
APR ..... AMPERITE
APX ..... AMPEREX
ARC ..... AMPLIFIER RESEARCH CORPORATION
ARE ..... ARROW ELECTRONICS
ARO ..... AROMAT CORPORATION
ARP ..... APPLE RUBBER PRODUCTS INCORPORATED
ART ..... ARTESYN TECHNOLOGIES
ASB ..... ASTRO-BUBBLES
ASC ..... AMERICAN SWITCH CORPORATION
ASD ..... AMERICAN STANDARD
ASP ..... ASSOCIATED SPRING
AST ..... ASTEC
ATC ..... AMERICAN TECHNICAL CERAMICS CORPORATION
ATL ..... ATLEE
AUG ..... AUGAT INTERCONN COMP DIVISION
AUV ..... A-U-VE-CO AUTO-VEHICAL PARTS CO
AVA ..... AVA CORPORATION
AVF ..... ALLENTOWN VALVE & FITTING COMPANY
AVT ..... AVANTEK
AVX ..... AVX CORPORATION
A-B ..... ALLEN BRADLEY

A-C ..... ANDREW CORPORATION
A-M ..... AEC MAGNETICS
A-S ..... ALCOSWITCH
A-T ..... AHAM-TOR
BBI ..... BARON-BLAKSLEE INCORPORATED
BDX ..... BENDIX
BEG ..... BERG CORP
BEL ..... BELDEN
BER ..... BERKLEY & COMPANY
BEY ..... BEY ELECTRIC
BFG ..... B.F. GOODRICH
BFI ..... BUCKEYE FORGE INCORPORATED
BKM ..... BECKMAN
BLL ..... BELLING LEE
BOG ..... BOSTON GEAR
BOK ..... BOKER'S INCORPORATED
BOP ..... BOPLA ENCLOSURES
BOR ..... BOURNS
BRD ..... BIRD ELECTRONICS
BRG ..... BERGQUIST
BUD ..... BUD COMPANY
BUL ..... BULGIN
BUS ..... BUSS
B-C ..... BONCO CORPORATION
B-E ..... BRIM ELECTRONICS
B-T ..... BEAU-TECH
B-V ..... BEAU/VERNITRON
CAD ..... CADDOCK
CAM ..... CAMBION
CAN ..... CANNON
CAP ..... CANPACK
CAR ..... CARLING
CAT ..... CATAMOUNT
CCI ..... CRL COMPONENTS INCORPORATED
CDC ..... COMPACT DEVELOPMENT CORPORATION
CDI ..... COAXIAL DYNAMICS INCORPORATED
CEN ..... CENTURY ELECTRONICS
CES ..... COUNTY ELECTRIC SUPPLY COMPANY
CGI ..... COMPONENT GENERAL INCORPORATED
CHE ..... CHERRY
CHO ..... CHOMERICS
CHR ..... CONNETICUT HARD RUBBER
CIN ..... CINCH
CJS ..... CENTRAL JERSEY SCREW & BOLT
CKS ..... C & K COMPONENTS INCORPORATED
CLA ..... CLAROSTAT
CLC ..... CHICAGO LOCK COMPANY
CMI ..... CERAMIC MAGNETICS INCORPORATED
CMP ..... COMMERCIAL PLASTICS
CMR ..... COLLMER
CMT ..... CONTINENTAL MICROWAVE & TOOL
CNF ..... CINCINNATI FAN
COE ..... COMP ENTERPRISES
COL ..... COLDER PRODUCTS

COM..... COMPUCON
CON .....CONCORD ELECTRONICS
COP.....COMPLETE PACKAGING
COR .....CORCOM
CPC .....C.P. CLARE
CPI .....COMPUTER PRODUCTS INC.
CPL .....COMPULITE
CPS.....COLOR PRINT SCREENING
CRC..... CRC CHEMICALS
CTS .....CTS OF BERNE INCORPORATED
CUS..... CUSTOM
C-D.....CORNELL-DUBILIER
C-E ..... CORNING ELECTRONIC
C-I .....CRAFTECH INDUSTRIES
C-P ..... CAPLUG COMPANY
C-T .....CANADIAN THERMOSTATS
CWD .....CESIWID INCORPORATED
DAL ..... DALE
DAT .....DATEL INC
DEL..... DELKER
DAY .....DAYTON
DEN .....DENNISON
DIA .....DIALIGHT
DII ..... DATONA INDUSTIRES INCORPORATED
DIL.....DIELECTRIC LABS
DKK..... DOW KEY/KILOVAC
DLS ..... DALLAS SEMICONDUCTOR
DLT..... DELTRON
DMT..... DMT DIV OF JAY-EL
DSC.....DE-STA-CO
DTP.....DOYLESTOWN PRINTING
DUP.....DU PONT ELECTRONICS
DYN.....DYNATECH
D-E.....DARBURN ELECTRONICS
D-G .....DIMCO-GRAY
D-K .....DIGI-KEY-CORPORATION
EBM..... EBM IND.
ECO..... EATON CORPORATION
ECS ..... ECS INTERNATIONAL
EFJ ..... E.F.JOHNSON
EGG ..... EG & G OPTOELECTRONICS
EGL.....ELGAL
EIC ..... ELCTRO INSULATION CORPORATION
EII ..... EDAL INDUSTRIES INC.
EIM ..... EIMAC
ELC.....ELECTRO SWITCH CORPORATION
ELM .....ELMENCO
ELR.....ENGLER INSTRUMENT
EMC ..... E.M.C. TECHNOLOGY
EMO..... EMED CO
EMI ..... ELECTRONIC MEASUREMENTS,INC.
EMM .....ENGLEMANN MICROWAVE
EOD ..... ELECTRO-OPTIC DEV
ERI ..... ERIE TECHNOLOGY PRODUCTS

ERM ..... EREM CORPORATION
ESX ..... ESSEX
ETA ..... ETA
ETM ..... ETM INC
EVE ..... EVEREST ELECTRONIC EQUIPMENT
EVR ..... EVEREADY
EWS ..... ELMWOOD SENSOR
E-C ..... EMERSON AND CUMMING
EZF ..... EZ FORM CABLE CORPORATION
FAR ..... FARNELL COMPONENTS
FCH ..... FAIRCHILD
FCI ..... FILTER CONCEPTS INCORPORATED
FER ..... FERRONICS
FEX ..... FERROXCUBE
FKN ..... FRANKLIN INT'L
FLO ..... FLO TRAN PNEU-DRAULICS INCORPORATED
FLP ..... FLURO PLASTICS
FOS ..... FIBRE OPTIC COMMUNICATION SPECIALTIES
FRA ..... FRANZUS
FRK ..... FROST KING
FRM ..... FREEDMAN/MALTA
FRP ..... FAIR-RITE PRODUCTS
FUJ ..... FUJITSU
FWC ..... FW CAPACITORS
F-S ..... FASTENER SPECIALTY
GAL ..... GALLAGER
GCE ..... G.C. ELECTRONICS
GCS ..... GLOBAL COMPUTER SALES
GEM ..... GEM
GDC ..... GENERAL DEVICES CO.
GLE ..... GLOBAL EQUIPMENT CO
GOL ..... GOLDKAMP
GRA ..... GRAINGER
GRE ..... GREYARC
GRS ..... GENERAL RADIO SUPPLY
GRY ..... GRAYHILL CORP
GSI ..... GSI
GTL ..... GILWAY TECHNICAL LAMP
G-E ..... GENERAL ELECTRIC COMPANY
G-I ..... GENERAL INSTRUMENT
GUD ..... GUDEN
HAD ..... HARRY DAVIES
HAN ..... HANSON
HAR ..... HARRIS CORP
HAV ..... HAVERHILL CABLE AND MANUFACTURING
HDB ..... HOMER D. BRONSON
HEC ..... HIGH ENERGY CORPORATION
HEI ..... HEINEMANN
HEY ..... HEYCO MOLDED PRODUCTS
HEX ..... HEXACON
HHS ..... H.H. SMITH
HII ..... HOLODAY INDUSTRIES INCORPORATED
HIM ..... HITACHI MAGNETS
HMF ..... HILTON MANUFACTURING

HMN ..... HENRY MANN
HOF ..... HOFFMAN PRODUCTS
HOL ..... HOLLINGSWORTH
HOW ..... HONEYWELL
HPC ..... H.P.CADWALLADER
HSI ..... HUBER & SUHNER INCORPORATED
HUB ..... HUBBEL
HUC ..... HUDSON CAN COMPANY
HUV ..... HANDLES UNLIMITED VERMALINE DIV.
HWK ..... HAWKINS METAL FABRICATION
H-C ..... HARTWELL CORP. COMMERCIAL DIVISION
H-P ..... HEWLETT/PACKARD
H-R ..... HERBACH & RADEMAN
IBM ..... IBM
ICI ..... ILLINOIS CAPACITOR INCORPORATED
IDE ..... IDEAL
IER ..... IERC
ILS ..... ILSCO
IMB ..... IMB
IMC ..... IMC
IML ..... IMLEC
INC ..... INTERNATIONAL CRYSTAL MFG COMPANY
INM ..... INMET
INT ..... INTERMATIC INC
IPI ..... INSULFAB PLASTICS INCORPORATED
IRC ..... INTERNATIONAL RESISTIVE COMAPNY, INC.
IRM ..... IR-CRYDOM
ITF ..... ITERFAN
ITJ ..... ITT-JENNINGS
ITT ..... ITT CANNON
IWI ..... INSULATED WIRE INC
I-E ..... IMPERIAL EASTMAN
I-G ..... INDIANA GENERAL
I-R ..... INTERNATIONAL RECTIFIER CORPORATION
I-S ..... INSTRUMENT SPECIALTIES
JAR ..... J.A. REINHARDT
JDE ..... JOHANSON DIELECTRICS
JER ..... JERGENS INCORPORATED
JFD ..... JFD
JOH ..... JOHANSON
JON ..... JONATHAN MANUFACTURING
JOR ..... JORITA
JSR ..... JAY-CEE SALES & RIVET INC.
KCC ..... KEYSTONE CARBON COMPANY
KEY ..... KEYSTONE ELECTRONICS
KIN ..... KINGS
KLE ..... KLEIN
KSD ..... KESTER SOLDER DIVISION
KUL ..... KULKA
K-D ..... KD COMPONENTS
LAF ..... LAFRANCE CORPRATION
LBA ..... LAMBDA ELECTRONICS INCORPORATED
LEM ..... LIAISONS ELECTRONIQUES MECHANIQUES
LEV ..... LEVITON MANUFACTURING COMPANY

LIF.....LITTLEFUSE
LOC.....LOCTITE CORPORATION
LOR.....LORD CORPORATION
LTC.....LINEAR TECHNOLOGY COPR
MAC.....MACOM
MAL.....MALLORY
MAR.....MARKEL CORPORATION
MAX.....MAXIM INTERGRATED PRODUCTS
M-C.....MICROCHIP
MCG.....McGILL
MCR.....MICREL INCORPORATED
MCS.....McMASTER CARR SUPPLY COMPANY
MCX.....MICRO-COAX
MDC.....MICROWAVE DEVELOPMENT CO.
MDP.....MODPAK
MEA.....MITSUBISHI ELECTRONICS AMERICA, INC.
MEP.....MEPCO-ELECTRA
MET.....METUCHEN CAPACITOR
MFG.....MANUFACTURER
MHW.....M.H. & W. COMPANY
MIC.....MICROMETALS IRON POWDER CORES
MIN.....MINI-CIRCUITS
MIP.....MICRO PLASTICS
MIR.....MINOR RUBBER COMPANY
MIS.....MICROSWITCH
MIT.....MULTITHERM CORPORATION
M-K.....MK
MLC.....M. LADER COMPANY
MLX.....MILL-MAX CORP
MMI.....MAGNETIC METALS INCORPORATED
MMM.....MINNESOTA MINING MANUFACTURING
MOC.....MOCAP
MOD.....MODUTEC
MOL.....MOLEX
MOR.....MORS COMPONENTS INC
MON.....MONSANTO
MOS.....M/A-COM OMNI SPECTRA INCORPORATED
MOT.....MOTOROLA
MPC.....MULTI-PRODUCTS
MRS.....MARSH
MSC.....MICROSEMI CORPORATION
MTH.....MICROTECH
MUE.....MUELLER
MUR.....MURATA/ERIE
MWA.....MICROWAVE ASSOC
MWC.....MIDWEST COMPONENTS
MWM.....MIDWEST MICROWAVE
MWS.....MICROWAVE SEMI-CONDUCTORS
M-C.....M & C SPECIALTIES
M-E.....MASTER ELECTRICIAN
M-M.....MULTI-MAX CORPORATION
M-S.....M SYSTEMS
NAB.....NORTH AMERICAN BRASS AND COPPER
NEB.....NEBS INCORPORATED

NET ..... NETEK
NEW ..... NEWAGE INDUSTRIES
NIA ..... NIAGRA PLASTICS
NIC ..... NIC COMPONENTS
NIE ..... NIELSEN HARDWARE
NJS ..... N.J. SEMI
NKK ..... NKK SWITCHES
NMB ..... NMB TECHNOLOGIES INCORPORATED
NOB ..... NOBLITT BROTHERS & COMPANY
NOR ..... NORITAKE
NPP ..... NORTH PENN POLISHING & PLATING
NSI ..... NATIONAL SEMI-CONDUCTOR CORPORATION
NVS ..... NORTHAMPTON VALLEY SERVICE COMPANY
N-I ..... NATIONAL INSTRUMENTS
N-M ..... NATIONAL MOLDITE
N-P ..... NEM-PACK
OAP ..... OLEAN ADVANCED PRODUCTS
OHA ..... OHIO ART
OHN ..... OHMLITE
OKI ..... OK INDUSTRIES
OME ..... OMEGA
OMR ..... OMRON
OPM ..... OPTIMA
OPT ..... OPTIMAX
OPX ..... OPTREX
PAE ..... PACIFIC ELECTRICORD
PAJ ..... PHILLIPS AND JACOBS
PAM ..... PAMOTOR
PAN ..... PANASONIC
PAP ..... PAPST
PBC ..... POTTER & BRUMFIELD CORPORATION
PCI ..... PENN CRAFT INDUSTRIES
PEC ..... PENN CONTROLS
PCC ..... PANEL COMPONENTS CORPORATION
PEK ..... PEAK
PEN ..... PENN ENGINEERING
PFL ..... POLYFLON
PFS ..... POWER FILM SYSTEMS
PHC ..... PARKER HANNIFIN CORPORATION
PHI ..... POWER HYBRID
PLM ..... PLASTIC & METALS
PMP ..... PRECISION METAL PROD.
PMI ..... PRECISION MONOLITHICS INC.
PNT ..... PANDUIT
P-O ..... POWER ONE
POW ..... POWEREX
PRC ..... PRECISION RUBER COMPANY
PSI ..... POWER SEMI-CONDUCTOR INCORPORATED
PSP ..... PROJECT SUPPORT INCORPORATED
PTC ..... PRECISION TUBE COMPANY
P-B ..... PENN-BASCO
QUI ..... QUICKSET
RAA ..... RADIALL
RAF ..... R.A.F. ELECTRONIC HARDWARE INCORPORATED

RCA ..... RCA
RCC ..... RAYCHEM CORPORATION
RCL ..... RCL
REL ..... RELIANCE MICA COMPANY
REM ..... REMTEK
RES ..... ROSE ENCLOSURES SYSTEMS
RFP ..... RF POWER COMPONENRS INC
RIC ..... RICHCO
ROG ..... ROGAN
RON ..... RONCO CORPORATION
ROS ..... ROSS ENGINEERING
ROT ..... ROTRON
ROW ..... ROWLAND
RPC ..... REPUBLIC PACKAGING CORPORATION
RUS ..... RUSSEL INDUSTRIES
R-H ..... RYAN HERCO
R-N ..... ROBINSON-NUGENT
R-S ..... RADIO SHACK
SAG ..... SAGE LABORATORIES
SAM ..... SAMTECH
SBC ..... SCHROEDER BROTHERS CORPORATION
SCD ..... SCHADOW
SCH ..... SCHAUER
SCI ..... SPECTRUM CONTROL INCORPORATED
SCO ..... SCOTCH
SEA ..... SEASTROM INCORPORATED
SEL ..... SELECTRO CORPORATION
SEM ..... SEMIKRON
SEV ..... SEVENTY-THREE MANUFACTURING COMPANY
SGL ..... SGL INDUSTRIES
SGS ..... SGS
SIE ..... SIEMENS
SIG ..... SIGNETICS
SIM ..... SIMPSON
SLE ..... SL ELECTRONICS
SOC ..... SOUTHCO
SOE ..... STANDARD OIL ENGINEERING
SOH ..... SOHIO
SOL ..... SOLDAPULLT
SOW ..... SOLDER WICK
SPC ..... SPC TECHNOLOGY
SPE ..... SPECTROL
SPL ..... SPRA-LUBE
SPR ..... SPRAGUE
SPS ..... SPRINGFIELD PAPER SPECIALISTS
SQR ..... SQR SECURITY COMPONENTS
SSI ..... SWITCHING SYSTEMS INTERNATIONAL
SSM ..... SOLD STATE MICROWAVE
SSS ..... S & S TECH
SST ..... SST
STA ..... STANCOR
STB ..... SEAL-TITE BAG COMPANY
STI ..... STIMPSON
STM ..... SEASTROM MANUFACTURING COMPANY

STP.....STACKPOLE
STW.....STOCKWELL
SUS.....SUNSHINE SCIENTIFIC
SWC.....SWITCHCRAFT
SHW.....STEWERT-WARNER HOBBS DIVISION
S-B.....SPEED BEND
S-E.....STEMCO/ENGLER
S-F.....SYDNEY FRIEDRICH
S-L.....SWAGELOCK
S-M.....STRIP-MASTER
TAB.....THOMAS & BETTS
TAI.....TAI CORPORATION
TAN.....TANSISTOR
TCC.....THOMSON PASSIVE COMPONENTS CORP
TCI.....TRA-CON INCORPORATED
TEC.....TECKNIT
TEL.....TELEFUNKEN
TEM.....TEMPIL
TET.....TECHNITOOL
TFI.....THRUWAY FASTNERS INCORPORATED
THM.....THERMALLOY
THS.....THREADED SCREW PRODUCTS COMPANY
TII.....TEXAS INSTRUMENTS INCORPORATED
TMS.....TIMES MICROWAVE SYSTEMS
TRD.....TRIAD
TRI.....TRI-COUNTY
TRS.....TRI-STATE
TRT.....TRAVERS TOOL COMPANY
TTC.....TITECO INC
TRU.....TRU CONNECTORS
TRW.....TRW
TUS.....TUSONIX
TXS.....TEXAS SPECTRUM
T-P.....THOMAS PRODUCTS
UEC.....UNITED ELECTRIC
ULI.....ULINE
UNC.....UNICORP
UN.....UNELCO
UNI.....UNIROYAL
UNM.....UNIMEC
USC.....USECO
UTI.....UTICA
V-C.....VICOR INC.
VFL.....VITAFOAM LIMITED
VIC.....VICTOREEN
VIT.....VITRAMON
VLR.....VLEIR
VOL.....VOLTRONICS CORPORATION
WAG.....WAGO COPR
WAK.....WAKEFIELD
WAL.....WALDOM
WCO.....WECO
WEC.....WESTERN ENTERPRISES COMAPNY
WEI.....WEICO

WEL ..... WELLER
WES ..... WEINSTEIN
WGV ..... WARREN G-V
WIE ..... WIELAND
WIL ..... WILTRON
WIS ..... WEBER INDUSTRIAL SUPPLY COMPANY
WIT ..... WITTEK DIVISION, A MICRODOT COMPANY
WPI ..... WIRE PRODUCTS INCORPORATED
WPS ..... WORKPLACE SYSTEM
WSC ..... WEST POINT SUPPLY COMPANY
WTK ..... WESTEK
WWP ..... WESTERN WIRE PRODUCTS
W-E ..... WELLS ELECTRONIC INCORPORATED
W-I ..... WEIDMULLER INCORPORATED
W-L ..... WARD LEONARD
XAC ..... X-ACTO
XCA ..... XCELITE
YNG ..... YOUNGS
YPC ..... YARDLEY PRODCTS CORPORATION
ZER ..... ZERO MANUFACTURING COMPANY
ZIE ..... ZIERIC

BILL NO: 1010541-501M REV: C U/M: EA DRAWING NO:
MDL,MODEL 50S1G4A

SEQ	PART NUMBER	REV	D E S C R I P T I O N	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
5000	1010552	D	SCHEM DIAG,50S1G4A	EA	REF	ARC-D\1010552	R(B)
5010	1010539	-	ASSY DWG,MODEL 50S1G4A	EA	REF	ARC-D\1010539	R(B)
5020	1010539-501	A	MODEL 50S1G4A,0.8-4.2 GHz,50 WATTS CW	EA	REF	ARC-D\1010539	BOM
5030	1010550	-	ASSY DWG,FINAL,50S1G4A	EA	REF	ARC-D\1010550	R(B)
5040	1010550-501	-	FINAL ASSY,50S1G4A	EA	REF	ARC-D\1010550	BOM
5050	1010551	A	ASSY DWG,AMP	EA	REF	ARC-D\1010551	R(B)
5060	1010551-501	B	AMP ASSY	EA	REF	ARC-D\1010551	BOM
5070	1008975-502	-	CABLE ASSY,COAX,SEMI-RIGID,SMA,SMA,6.0"	EA	REF	ARC-B\1008975	BOM
5080	1008975-501	-	CABLE ASSY,COAX,SEMI-RIGID,SMA,SMA,5.5"	EA	REF	ARC-B\1008975	BOM
5090	1008976-501	-	CABLE ASSY,COAX,SEMI-RIGID,SMA,SMA,3.5"	EA	REF	ARC-B\1008976	BOM
5100	1008976-502	-	CABLE ASSY,COAX,SEMI-RIGID,SMA,SMA,4.0"	EA	REF	ARC-B\1008976	B
5110	1008781	-	ASSY DWG,CABLE ASSY	EA	REF	ARC-B\1008781	B
5120	1008781-501	-	CABLE ASSY,COAX,SEMI-RIGID,SMA,SMA,8.0"	EA	REF	ARC-B\1008781	BOM
5130	1008781-502	-	CABLE ASSY,COAX,SEMI-RIGID,SMA,SMA,9.0"	EA	REF	ARC-B\1008781	BOM
5140	1008781-503	-	CABLE ASSY,COAX,SEMI-RIGID,SMA,SMA,10.0"	EA	REF	ARC-B\1008781	BOM
5150	1008781-504	-	CABLE ASSY,COAX,SEMI-RIGID,SMA,SMA,11.0"	EA	REF	ARC-B\1008781	BOM
5160	1008782	-	ASSY DWG,CABLE ASSY	EA	REF	ARC-B\1008782	B
5170	1008782-501	-	CABLE ASSY,COAX,SEMI-RIGID,SMA,SMA,10.0"	EA	REF	ARC-B\1008782	BOM
5180	1008782-502	-	CABLE ASSY,COAX,SEMI-RIGID,SMA,SMA,9.0"	EA	REF	ARC-B\1008782	BOM
5190	1008782-503	-	CABLE ASSY,COAX,SEMI-RIGID,SMA,SMA,8.0"	EA	REF	ARC-B\1008782	BOM
5200	1008782-504	-	CABLE ASSY,COAX,SEMI-RIGID,SMA,SMA,7.0"	EA	REF	ARC-B\1008782	BOM
5210	1010564	C	ASSY DWG,RF LOW LEVEL	EA	REF	ARC-D\1010564	R(B)
5220	1010564-501	E	RF,LO LEVEL ASSY	EA	REF	ARC-D\1010564	BOM
5230	1010568-501	B	HARNESS ASSY,LO LEVEL	EA	REF		BOM

BILL NO: 1010541-501M REV: C U/M: EA DRAWING NO:
MDL,MODEL 50S1G4A

SEQ	PART NUMBER	REV	D E S C R I P T I O N	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
5240	1010753-501	-	ASSY,CONTROLLER,50S1G4A	EA	REF		BOM
5245	1012408	-	SCHEM DIAG,VAR GAIN/PROT CIR	EA	REF	ARC-D\1012408	R(B)
5250	1012338	-	SCHEM DIAG,VARIABLE GAIN AMP/DET	EA	REF	ARC-D\1012338	R(B)
5260	1012337	-	ASSY DWG,VARIABLE GAIN/DET	EA	REF	ARC-D\1012337	R(B)
5270	1012337-501	-	PWB ASSY,VARIABLE GAIN AMP/DET	EA	REF	ARC-D\1012337	BOM
5280	1008805-501	-	HARNESS ASSY,PRE-AMP\LEVELER	EA	REF		BOM
5290	1012335	-	SCHEM DIAG,LINEARIZER/CTRL	EA	REF	ARC-D\1012335	R(B)
5300	1012334	-	ASSY DWG,LINEARIZER/CTRL BD	EA	REF	ARC-B\1012334	B
5310	1012334-501	A	PWB ASSY,LINEARIZER/CTRL BD	EA	REF	ARC-B\1012334	BOM
5320	1010749	B	SCHEM DIAG,BIAS CTRL	EA	REF	ARC-C\1010749	B
5330	1010591	A	SCHEM DIAG,LOW LEVEL "S" MODULE	EA	REF	ARC-B\1010591	B
5340	1010589	D	ASSY DWG,LOW LEVEL "S" MODULE	EA	REF	ARC-C\1010589	R(A)
5350	1010589-501	C	PWB ASSY,LOW LEVEL "S" MODULE	EA	REF	ARC-C\1010589	BOM
5360	1008806-501	C	HARNESS ASSY,1 WATT AMP	EA	REF		BOM
5370	1010902	A	SCHEM DIAG,BIAS CONTROL	EA	REF	ARC-B\1010902	B
5380	1009163	E	SCHEM DIAG,QUAD AMP,100S1G4	EA	REF	ARC-C\1009163	A
5390	1009161	H	ASSY DWG,QUAD AMP	EA	REF	ARC-D\1009161	A
5400	1009161-501	L	PWB ASSY,QUAD AMP,100S1G4	EA	REF	ARC-D\1009161	BOM
5410	1010748	A	ASSY DWG,BIAS CTRL,1W S MODULE	EA	REF	ARC-C\1010748	R(A)
5420	1010748-501	B	PWB ASSY,BIAS CTRL,1W S MODULE	EA	REF	ARC-C\1010748	BOM
5430	1008632	-	SCHEM DIAG,2 WAY SPLITTER	EA	REF	ARC-B\1008632	
5440	1008627-501	A	RF ASSY,FINAL	EA	REF	ARC-D\1008627	BOM
5440	1008630	A	ASSY DWG,2 WAY SPLITTER	EA	REF	ARC-B\1008630	B
5450	1008630-501	A	PWB ASSY,2 WAY SPLITTER	EA	REF	ARC-B\1008630	BOM

BILL NO: 1010541-501M REV: C U/M: EA DRAWING NO:
MDL,MODEL 50S1G4A

SEQ	PART NUMBER	REV	D E S C R I P T I O N	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
5460	1010571	A	ASSY DWG,AUX RF LOW LEVEL	EA	REF	ARC-B\1010571	R(A)
5470	1010571-501	B	AUX RF LOW LEVEL ASSY	EA	REF	ARC-B\1010571	BOM
5510	1010074	-	SCHEM DIAG,4 WAY SPLITTER #3	EA	REF	ARC-B\1010074	B
5520	1010072	A	ASSY DWG,4 WAY SPLITTER #3	EA	REF	ARC-D\1010072	B
5530	1010072-501	A	PWB ASSY,4 WAY SPLITTER #3	EA	REF	ARC-D\1010072	BOM
5560	1007409	C	ASSY DWG,COMBINER ASSY,8 WAY	EA	REF	ARC-C\1007409	R(B)
5570	1007409-501	C	COMBINER ASSY,8 WAY	EA	REF	ARC-C\1007409	BOM
5580	1010554	B	ASSY DWG,PS	EA	REF	ARC-D\1010554	R(B)
5590	1010554-501	B	PS ASSY	EA	REF	ARC-D\1010554	BOM
5600	1010555-501	B	HARNESS ASSY,PS,50S1G4A	EA	REF		BOM
5610	1010553	B	ASSY DWG,CTRL PNL	EA	REF	ARC-D\1010553	R(B)
5620	1010553-501	B	CTRL PNL ASSY	EA	REF	ARC-D\1010553	BOM
5630	1008597	B	SCHEM DIAG,OPERATE/CONTROL(OCB)	EA	REF	ARC-D\1008597	R(D)
5640	1008595	D	ASSY DWG,OPERATE/CONTROL(OCB)	EA	REF	ARC-C\1008595	R(D)
5650	1008595-501	C	PWB ASSY,OPERATE/CONTROL(OCB)	EA	REF	ARC-C\1008595	BOM
5655	1009511	A	SCHEM DIAG,REG CTRL BD	EA	REF	ARC-D\1009511	R(A)
5670	1009512	-	ASSY DWG,REG CTRL BD	EA	REF	ARC-C\1009512	R(A)
5680	1009512-501	-	REG CTRL BD ASSY	EA	REF	ARC-C\1009512	BOM

* * * END OF REPORT E0056 - 12:52:37 13 JUN 2002 * * *

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ECN	DATE	REV.
REL. #2022-01	16AUG99	-
1024044	NOV99	A
104752	24MAR00	B
106423	3AUG00	C
112098	6MAR02	D

J1 RF INPUT

W1

A1 VAR GAIN AMP SCHEM 1012338
ATTN
C9 C10 C11 C12 C13
C16

W2

A4 1 WATT AMP SCHEM 1010591
C3 C4 C5 C6 C7 C8

W3

A5 BIAS CTRL CKT SCHEM 1010902
J2 P5 P6 J1 P2
+16.5V
GND
-5V

A6 C28 QUAD AMP C4 C1 -5V +16.5V

W4

A7 2 WAY SPLITTER

W5

W6

A8 C28 QUAD AMP C4 C1 -5V +16.5V

A9 C28 QUAD AMP C4 C1 -5V +16.5V

W7

W8

RF GAIN
R1 10K CW
R2 12K
P/O J3
P/O
P/O P13 (P12-8)
(P12-10) (P12-9) TO A22

A3 LINEARIZER/CTRL CKT SCHEM 1012335
P/O P7 P/O J1
P/O P1 P/O J1
-15V
+15V

S2 S1

P/O J1
P/O P7
(+16.5,+16.5,A12-A19)
+16.5V
+15V -15V -5V +16.5

A10 SPLITTER

A11 SPLITTER

W9 W10 W11 W12 W13 W14 W15 W16

A12 C28 QUAD AMP C4 C1 -5V +16.5V
A13 C28 QUAD AMP C4 C1 -5V +16.5V
A14 C28 QUAD AMP C4 C1 -5V +16.5V
A15 C28 QUAD AMP C4 C1 -5V +16.5V

W17 W18 W19 W20 W21 W22 W23 W24

A16 C28 QUAD AMP C4 C1 -5V +16.5V
A17 C28 QUAD AMP C4 C1 -5V +16.5V
A18 C28 QUAD AMP C4 C1 -5V +16.5V
A19 C28 QUAD AMP C4 C1 -5V +16.5V

A20 COMBINER

W25

RF OUTPUT

S4

S3

FL1
LINE
NEUT
GND

CB1

P3 J1
PS1
LINE
NEUT
+12 +5 GND -12
P1
J2
P4

K1

PS2
LINE
NEUT
GND
PS INHIBIT
+16.5V
+24V
-24V
J1
P8

B1 B2 B3

S5 PWR
REMOTE
S6 LOCAL
S7 FAULT RESET
P/O J3 P/O P13

A21
P/O P1 P/O J1
K1
THERMAL FAULT
P.S. INHIBIT
+12V
+5V
-12V
OPERATE/CONTROL OCB
FAULT DET
-5V FAULT
-15V FAULT
+15V FAULT
+16.5V FAULT
AMP FAULT
REMOTE INTLK
(+16.5V PS2)

A22
P/O P12 P/O J1
+12V IN
OPERATE IN
P/O P10 P/O J2
-5V FAULT OUT
-15V FAULT OUT
+15V
AMP FAULT
P/O P12 P/O J1
REMOTE GAIN ENABLE
ANALOG GAIN SIGNAL
REGULATOR/CONTROL BD SCHEMATIC 1009511

P/O J2 P/O P10
TO K1 +12
-5V OUT
+16.5V
-15V OUT
+15V OUT
P/O J1 P/O P12
+24 IN
-24V IN
A6,A8,A9 FAULT
A12,A13 FAULT
A14,A15 FAULT
A16,A17 FAULT
A18,A19 FAULT
RF GAIN CONT (WIPER)
LINEARIZER/CTRL GAIN
LINEARIZER/CTRL DET
P/O J2 P/O P10

J3 P11
INTERLOCK

J1 P9
DISPLAY

P2 IEEE-488
P3 RS-232

QTY. REQD.	ITEM	PART NO.	DESCRIPTION	MARK	FIN	MATL
		PARTS LIST				

UNLESS OTHERWISE SPECIFIED DO NOT SCALE DRAWING. DIMENSIONS ARE IN INCHES AND INCLUDE PLATING THICKNESS. ALL THREADS ARE UNIFIED NATIONAL SERIES, CLASS 2. REMOVE ALL BURRS AND SHARP EDGES.

BASIC DIMENSIONS	2 PLACE DECIMALS	3 PLACE DECIMALS
UP TO 6	±.02	±.005
ABOVE 6 TO 24	±.03	±.010
ABOVE 24	±.06	±.015

ANGULAR DIMENSIONS 1/2°

50S1G4 USED ON MODEL

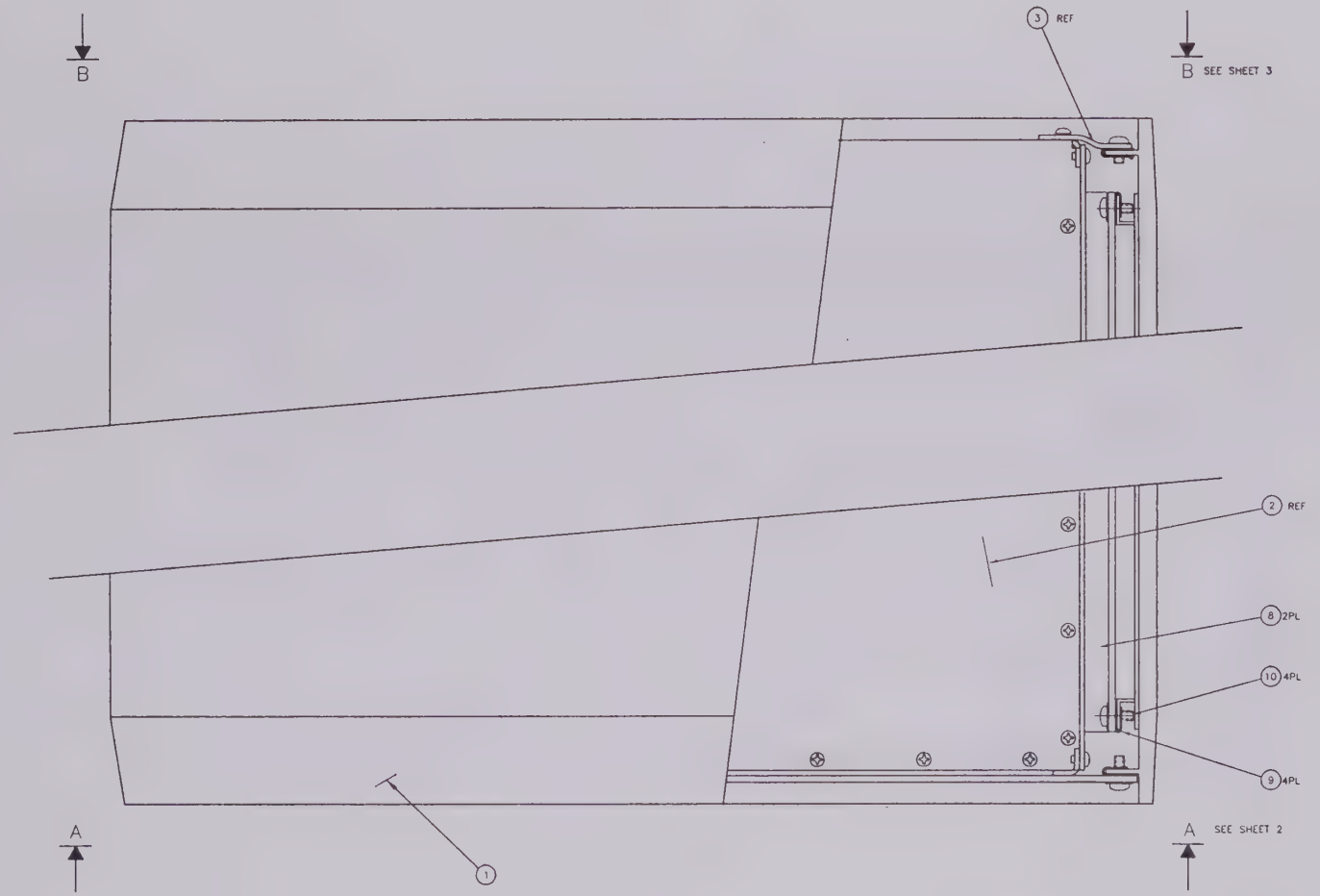
DRAWN G.JACKSON DATE 14 MAY99
CHKD G.JACKSON DATE 14 MAY 99
MECH J.MAGINN DATE 8/18/99
ELEC F.SCHIRK DATE 17 AUG 99

AMPLIFIER RESEARCH

SCHEMATIC 50S1G4A

DWG. NO. 1010552

SCALE 1/1 SHEET 1 OF 1 REV. D



ECN	DATE	REV
REL #2022-01	10AUG94	–

FOR BOM SEE 1010539-501

SHT	1	2	3
REV	–	–	–

ITEM	PART NO	DESCRIPTION	MARK	FIN	MAIL
QTY REQD	PARTS LIST				

UNLESS OTHERWISE SPECIFIED
DO NOT SCALE DRAWING
ENGINEERING KEY IN INCHES AND INCLUDE PLATING THICKNESS
ALL TOLERANCES ARE LIMITED NATIONAL BSMS, CLASS 3
BREAK ALL BURRS AND SHARP EDGES

BASIC SIZE RANGE	2 PLACE DECIMALS	3 PLACE DECIMALS
UP TO 6	± .03	± .005
ABOVE 6 TO 31	± .10	± .010
ABOVE 31	± .25	± .015

ANGULAR DIMENSIONS +/-2°

50S1G4A
USED ON MODEL

DRAWN G.JACKSON DATE 21 JUN 88
CHKD G.JACKSON DATE 21 JUN 88
MECH DATE
ELEC DATE

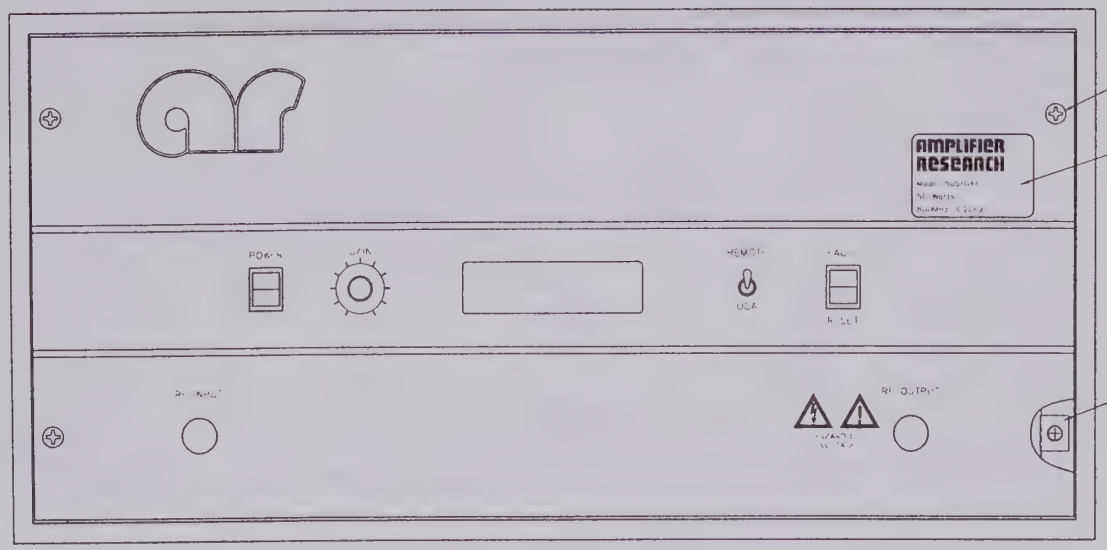
AMPLIFIER RESEARCH

MODEL 50S1G4A

DWG. NO. 1010539-501

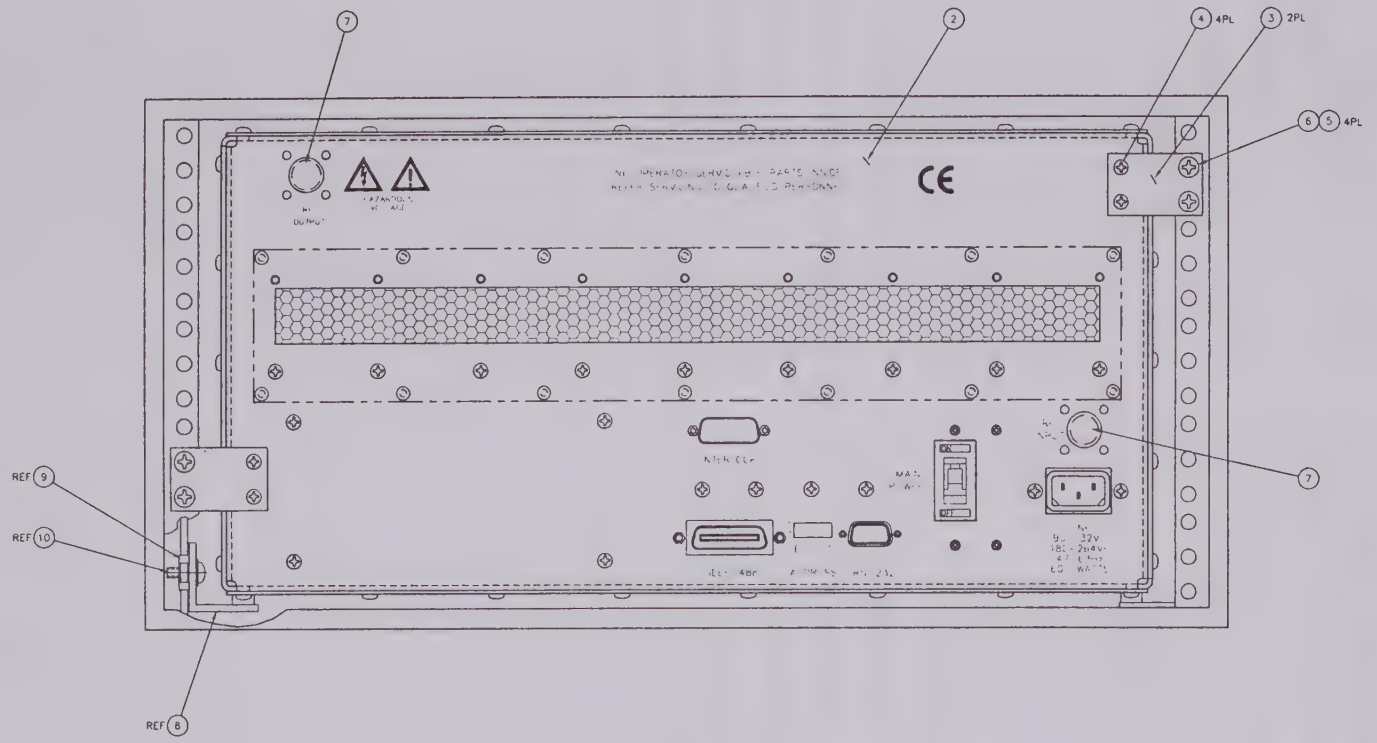
SCALE 1/1 SHEET 1 OF 3 REV —

ECN	DATE	REV
REL #2022-0	11/04/22	-



SECTION A–A

DWG NO	1010539	
SCALE 1/1	SHEET 2 OF 3	REV -



1010539

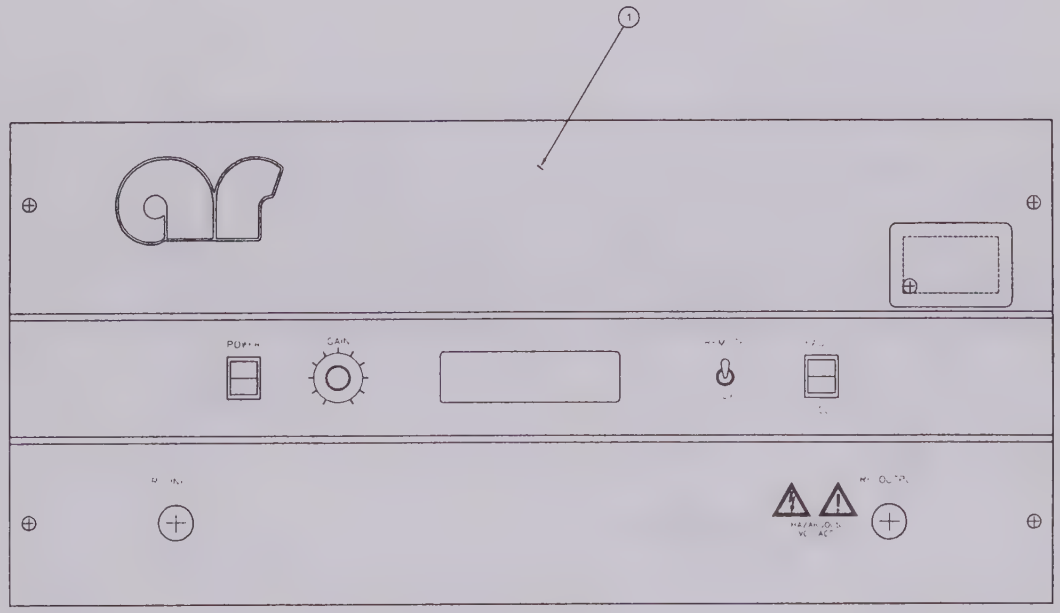
SCALE 1/1 SHEET 3 OF 3 REV –

BILL NO: 1010539-501 REV: A U/M: EA DRAWING NO: ARC-D\1010539
MODEL 50S1G4A,0.8-4.2 GHz,50 WATTS CW

SEQ	PART NUMBER	REV	D E S C R I P T I O N	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
0010	1010539	-	ASSY DWG,MODEL 50S1G4A	EA	REF	ARC-D\1010539	
0020	1010552	D	SCHEM DIAG,50S1G4A	EA	REF	ARC-D\1010552	
0030	1010541-501		MANUAL,MODEL 50S1G4A	EA	4.000		
5000	1001576-314	T	CABINET,INST CASE,PERF BOT PNL,8.75 H,19.94 D	EA	1.000	ARC-B\1001576	1
5010	1010550-501	-	FINAL ASSY,50S1G4A	EA	1.000	ARC-D\1010550	2
5020	1008771-101	-	BRKT,SHIPPING	EA	2.000	ARC-D\1008771	3
5030	11137		SCREW,MACH,PAN HD,CROSS-REC,S/ZN,6-32X.31,TYPE SW	EA	4.000		4
5040	14043		FASTENER,"U" TYPE,10B SCREW,PNL RANGE .125-.160	EA	8.000	ECO\C14810-102	5
5050	94027		SCREW,PNL,DECORATIVE,WITH NYLON WASH	EA	8.000	OPM\HW-1	6
5060	69111		PLUG,HOLE,METAL,5/8"DIA HOLE,13/16"O/A DIA	EA	2.000	HHS\654	7
5070	1008772-101	-	ANGLE,SUPPORT,SIDE	EA	2.000	ARC-B\1008772	8
5080	14000		FASTENER,TINNERMAN,C8121-101-4	EA	8.000	ECO\C8121-10-4	9
5090	11130		SCREW,MACH,HEX HD SLTD,S/ZN PLTG,#10 X.50,TYPE B	EA	4.000		10
5100	1007226-101-F1-M246	DC	PL,MODEL NO,50S1G4A	EA	1.000	ARC-A\1007226	11
5110	66147		PWR CORD,3 COND,18AWG,UNIV DTCH	EA	1.000	PAE\C3120-008-BL	

ECN REL	DATE	REV

REL #2022-01



SHEET	1	2	3	4
REV	–	–	–	–

FOR BOM SEE 1010550-501

QTY REQD	ITEM	PART NO	DESCRIPTION	MARK	FINAL
		PARTS LIST			

UNLESS OTHERWISE SPECIFIED DO NOT SCALE DRAWING. DIMENSIONS ARE IN INCHES AND INCLUDE PLATING THICKNESS. TOLERANCES ARE UNLESS OTHERWISE NOTED.

DIMENSIONS	2 PLACE DECIMALS	3 PLACE DECIMALS
UP TO 6	± .02	± .005
ABOVE 6 TO 24	± .03	± .010
ABOVE 24	± .05	± .015

ANGULAR DIMENSIONS ± 1/2°

50S1G4A
USED ON MODEL

DRAWN G.JACKSON DATE 4 MAY 99
CHKD G.JACKSON DATE 4 MAY 99
MECH DATE
ELEC DATE

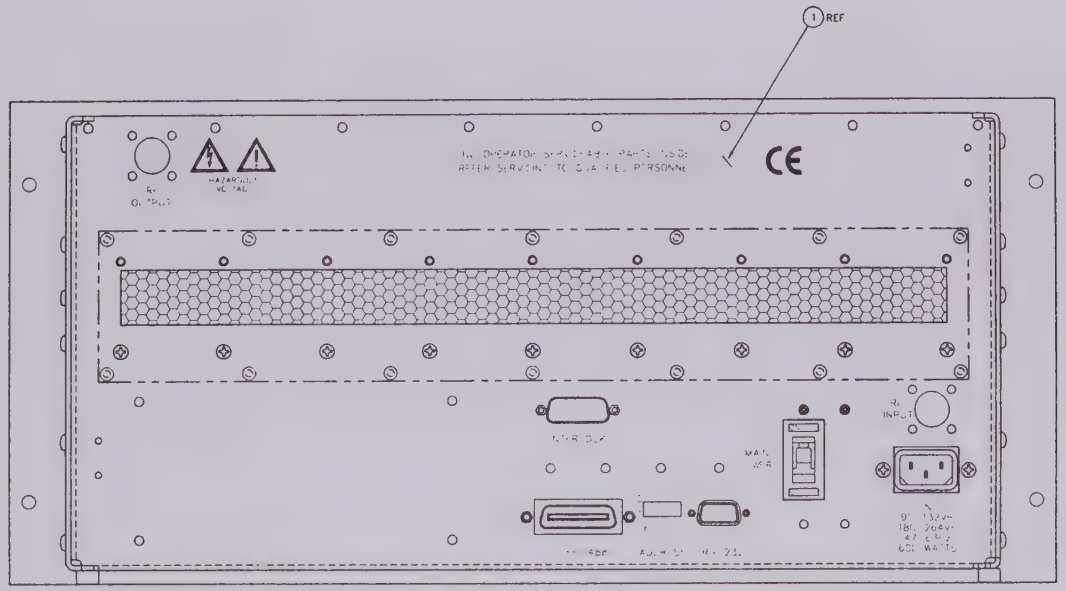
AMPLIFIER RESEARCH

FINAL ASSY
50S1G4A

DWG NO. 1010550

SCALE 1/1 SHEET 1 OF 4 REV —

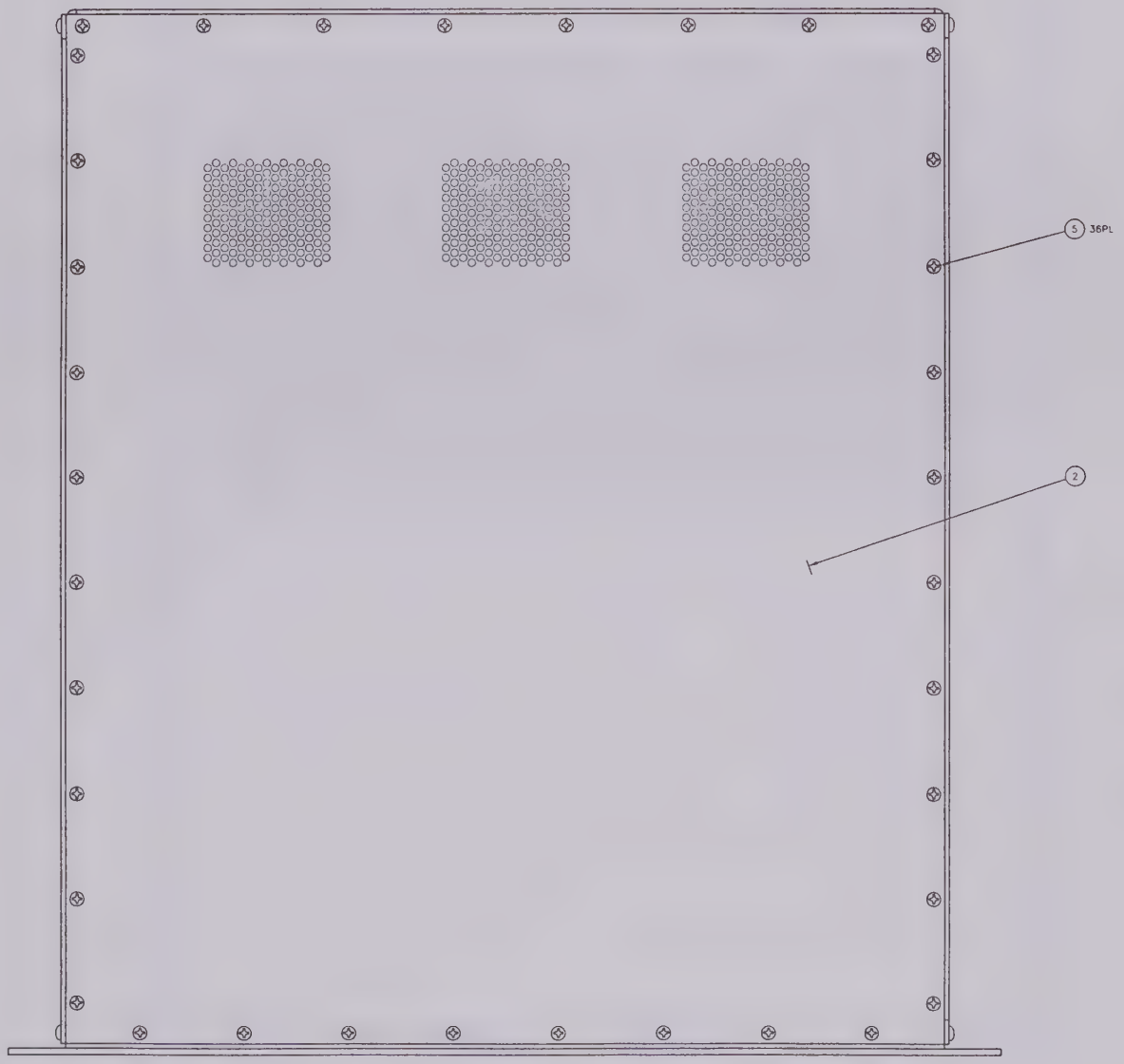
ECN	DATE	REV
REL #2022-01	4 MARCH	-



DWG NO	
	1010550
SCALE 1/1	SHEET 2 OF 4
	REV -

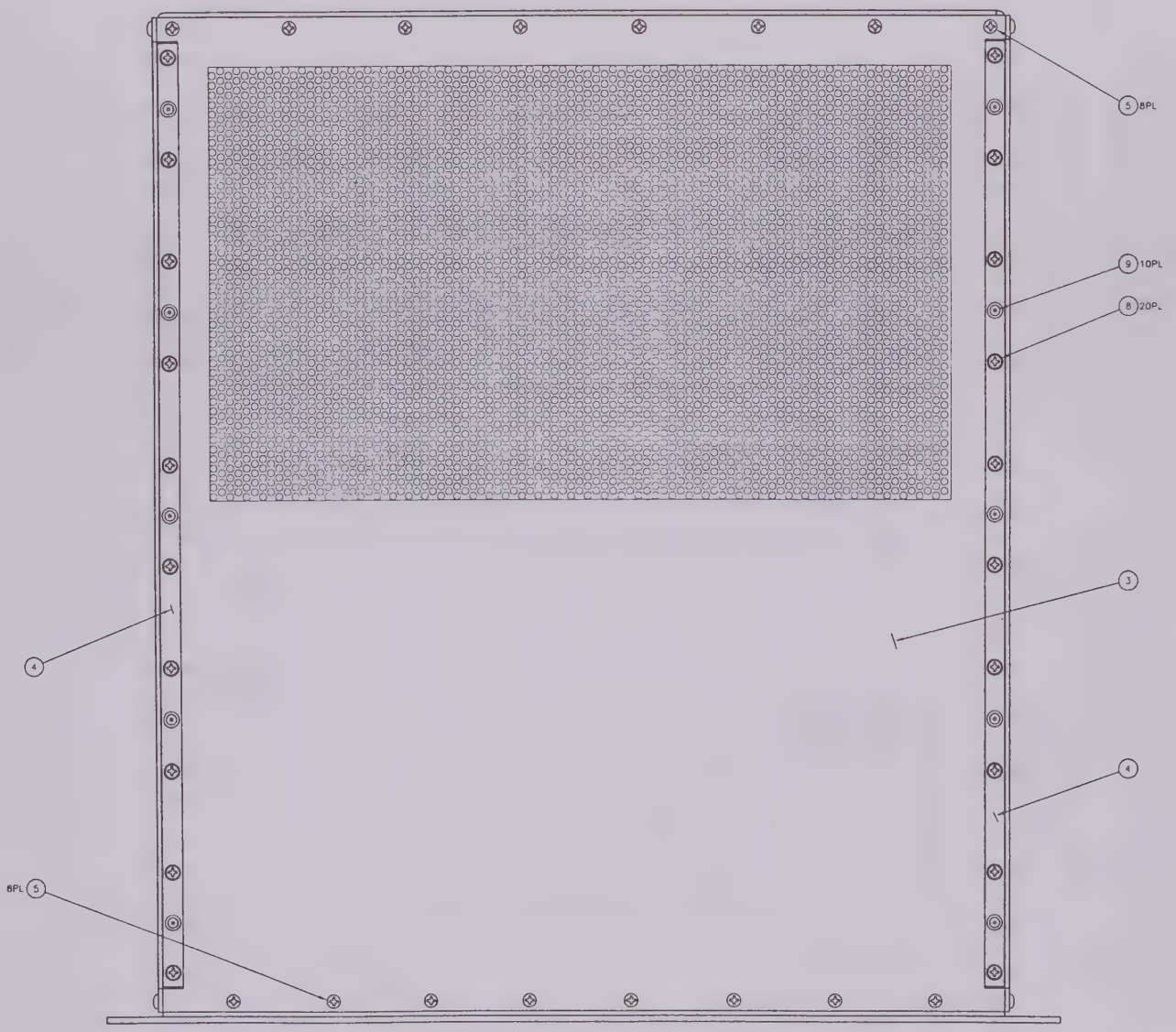
REL #2022-01

ECN	DATE	REV
REL	6/6/2022	*



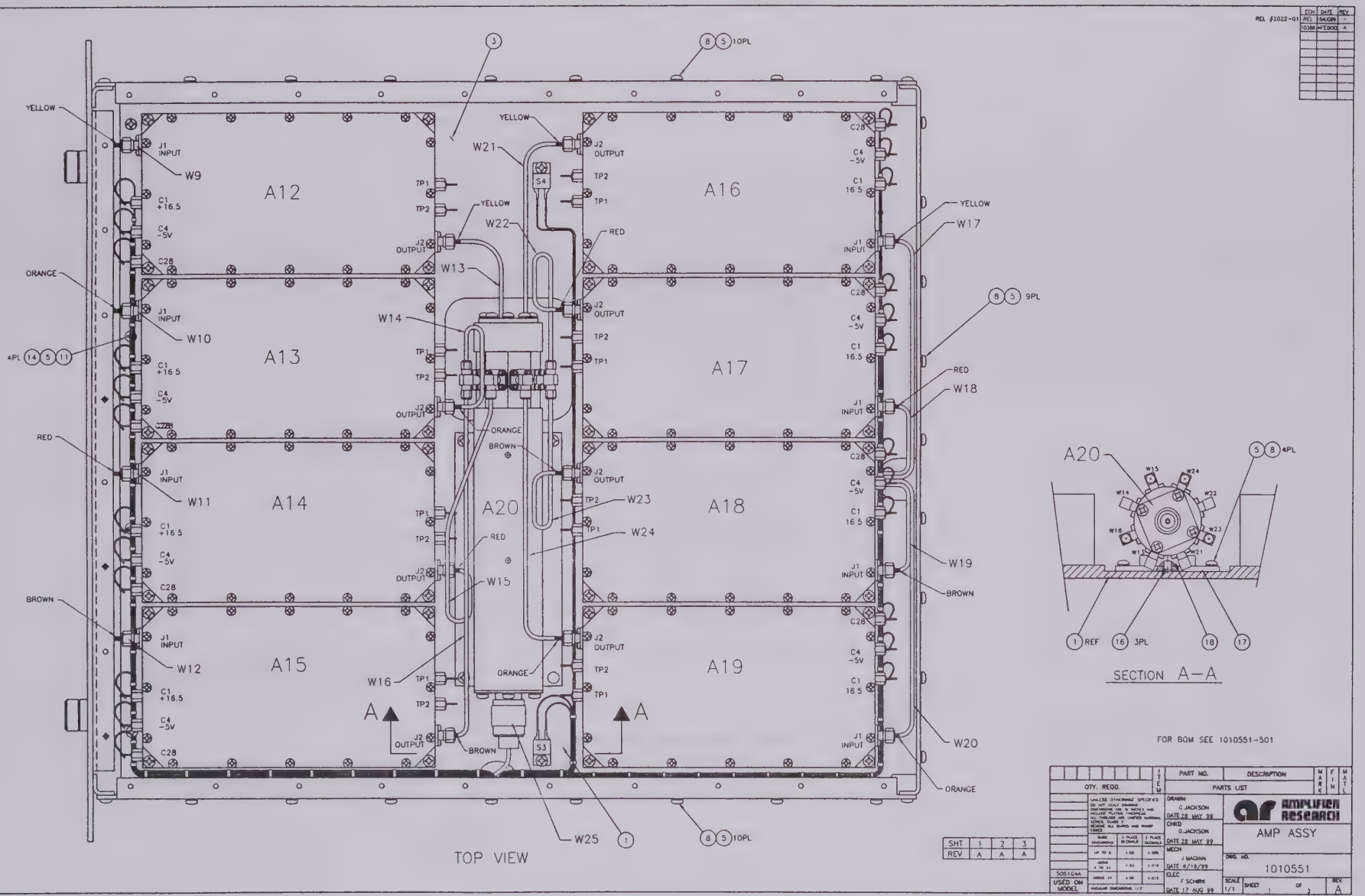
DWG NO
1010550

SCALE 1/1 SHEET 3 OF 4 REV —


5 8PL
9 10PL
8 20PL
3
4
4
8PL 5

BILL NO: 1010550-501 REV: - U/M: EA DRAWING NO: ARC-D\1010550
FINAL ASSY,50S1G4A

SEQ	PART NUMBER	REV	D E S C R I P T I O N	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
0010	1010550	-	ASSY DWG,FINAL,50S1G4A	EA	REF	ARC-D\1010550	
5000	1010551-501	B	AMP ASSY	EA	1.000	ARC-D\1010551	1
5010	1008612-101	-	COVER,TOP	EA	1.000	ARC-D\1008612	2
5020	1008621-101	-	COVER,BOTTOM	EA	1.000	ARC-D\1008621	3
5030	1008773-101	A	GLIDE	EA	2.000	ARC-C\1008773	4
5040	11137		SCREW,MACH,PAN HD,CROSS-REC,S/ZN,6-32X.31,TYPE SW	EA	52.000		5
5065	11018		SCREW,MACH,PAN HD,CROSS-REC,ZN,6-32 X .38,TYPE SW	EA	20.000		8
5070	69120		RIVET,GRIP-TITE,A,1/8"DIA,1/8-1/4"MAT'L THK	EA	10.000	GRA\5X520	9



SECTION A–A

SHT	1	2	3
REV	A	A	A

FOR BOM SEE 1010551-501

ITEM	QTY. REQD.	PART NO.	DESCRIPTION	MARK	FIN	MATL
			PARTS LIST			

UNLESS OTHERWISE SPECIFIED DO NOT SCALE DRAWING DIMENSIONS ARE IN INCHES DIMENSIONING AND TOLERANCING PER ALL TOLERANCES ARE LIMITED TO DECIMAL SCALE: CHANGE: 2 REVISE ALL BLANKS AND SHARP EDGES

	BASIC DIMENSIONS	2 PLACE DECIMALS	3 PLACE DECIMALS
	UP TO 6	± .02	± .005
	OVER 6 TO 24	± .03	± .010
	OVER 24	± .06	± .015

MACHINE SMOOTHING 1/2"

USED ON MODEL: 50S1GAA

DRAWN: G JACKSON DATE 28 MAY 99
CHKD: G JACKSON DATE 28 MAY 99
MECH: J MAGINN DATE 6/18/99
ELEC: F SCHIRK DATE 17 AUG 99

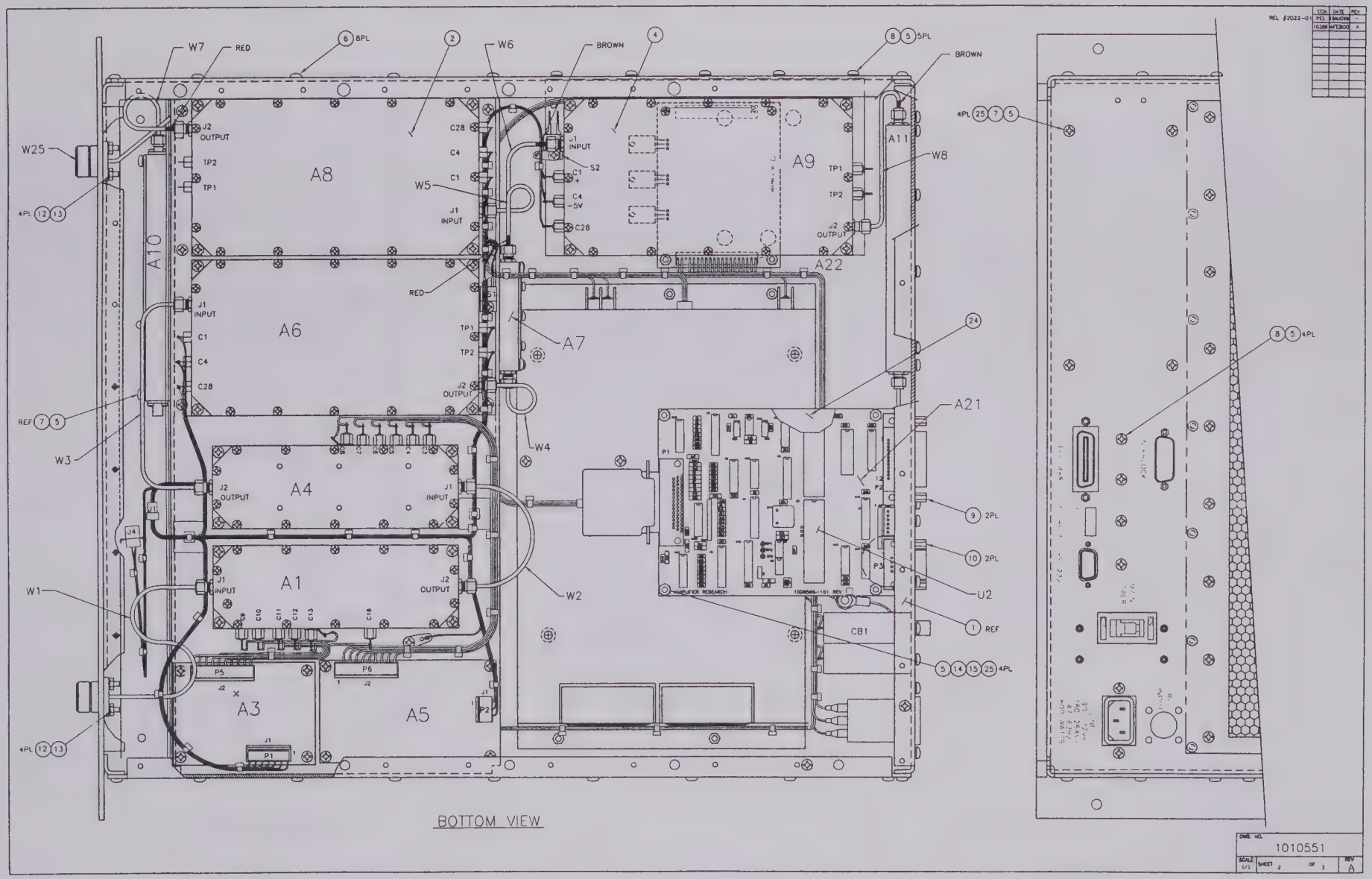
AMPLIFIER RESEARCH

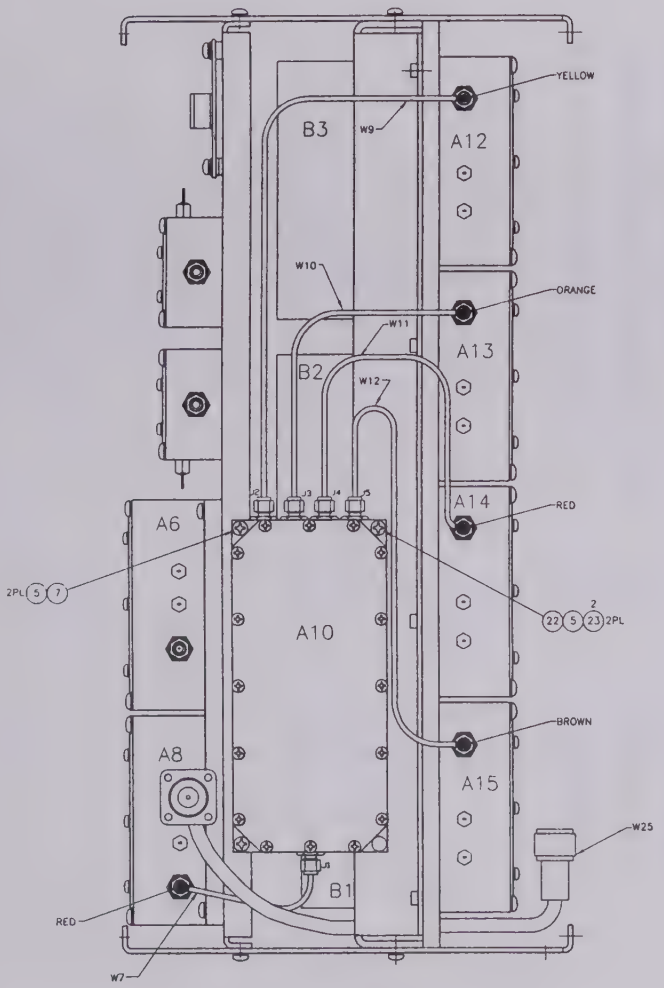
AMP ASSY

DWG NO. 1010551

SCALE 1/1 SHEET 1 OF 3 REV A

ECN	DATE	REV
REL #2022-01	6AUG99	-
10388	4FEB02	A


W7
RED
8PL
W6
BROWN
5PL
W25
4PL 12 13
A8
A9
A10
A11
A22
A6
A7
A4
A1
A3
A5
A21
W5
W8
W4
W3
REF 7 5
W1
W2
U2
CB1
2PL
REF
4PL 25 7 5
BOTTOM VIEW
1010551



FRONT VIEW
CONTROL PNL REMOVED

AMP ASSY PROCEDURE

1.0 REMOVE CONTROL PANEL FROM THE POWER SUPPLY ASSEMBLY

2.0 REMOVE RIGHT SIDE PANEL, P/N 1008607-101 FROM THE POWER SUPPLY ASSEMBLY

3.0 INSTALL THE FINAL RF ASSY HEATSINK ;P/N 1008627, (ITEM 3) INTO POWER SUPPLY, ATTACH WITH SCREWS TO REAR PANEL P/N 1010562-301 (ITEM 1) AND LEFT SIDE PANEL, P/N 1010559-101

4.0 ADD VIOLET JUMPER BETWEEN A12-C4 AND A19-C4 BEFORE TIE WRAPPING WIRING HARNESS

5.0 INSTALL THE RF LOW LOW LEVEL ASSY. ATTACH WITH SEVERAL SCREWS THRU LEFT SIDE OF POWER SUPPLY.

6.0 PUT THE OUTPUT CABLE (W25) IN PLACE IN THE FINAL HEAT SINK AND POWER SUPPLY CHASSIS.

7.0 INSTALL THE RIGHT SIDE OF THE POWER SUPPLY.

8.0 INSTALL A10 AND A11, FOUR WAY SPLITTERS.

9.0 INSTALL COAX CABLE ASSEMBLIES W9,W10,W11,W12,W18,W17 W19 AND W20 FORM BENDS CAREFULLY

10.0 INSTALL W7 FROM A8, QUAD AMP, TO A10, SPLITTER

11.0 INSTALL CABLE W8 TO INPUT OF A11, 4 WAY SPLITTER POSITION OTHER OTHER END FOR EASY ATTACHMENT TO A9

12.0 INSTALL A9, DRIVER ASSY. ATTACH TO SIDE WALL. ATTACH COAX, W8, TO OUTPUT OF A9.

13.0 INSTALL COAX CABLES W4,W5 AND W6

14.0 INSTALL THE A21, OPERATE CONTROL BOARD.

15.0 INSTALL W1 INTO CONTROL PANEL. INSTALL W25 TO CONTROL PANEL WHILE POSITIONING THE CONTROL PANEL INTO PLACE. SECURE CONTROL PANEL.

16.0 INSTALL REMAINING DRIVER CABLES W2 AND W3

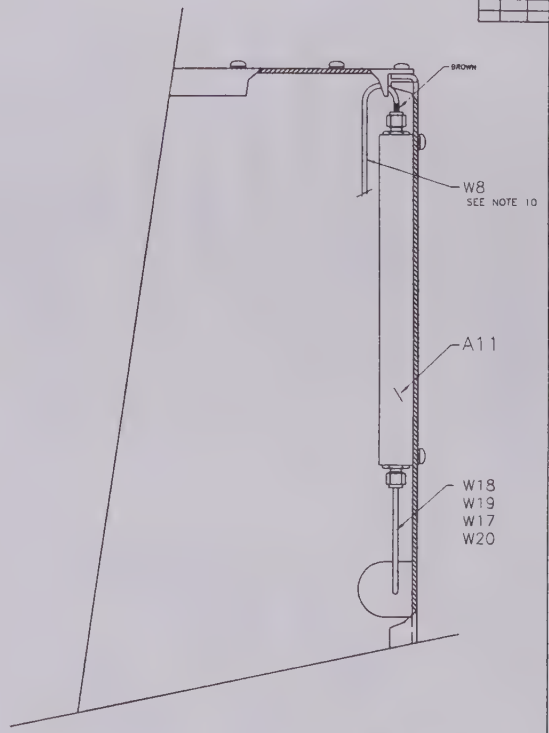
17.0 INSTALL SPACER, ITEM 15, AND MOUNTING BRACKET, ITEM 17 TO THE EIGHT WAY COMBINER (A20)

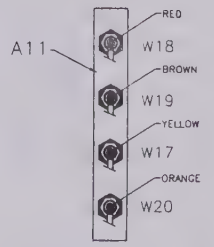
18.0 SET THE EIGHT WAY COMBINER (A20) IN THE APPROX FINAL INSTALLATION POSITION

19.0 CAREFULLY PREFORM THE COAX CABLES WHICH ATTACH TO THE 8 WAY COMBINER (A20) FROM THE OUTPUTS OF THE QUAD AMPS

20.0 TIGHTEN COAX CABLES W13 AND W21 TO THE EIGHT WAY COMBINER (A20) BEFORE INSTALLING THE COMBINER

21.0 ATTACH THE EIGHT WAY COMBINER (A20) TO THE HEAT SINK FINAL. TIGHTEN ALL COAX CABLES TO THE EIGHT WAY COMBINER AND THE OUTPUTS OF THE AMPLIFIER.





ECN	DATE	REV
REL	16AUG89	-
10399	4FEB00	A

REL #2022-01

DWG. NO.
1010551

SCALE 1/1 | SHEET 3 OF 3 | REV. A

BILL NO: 1010551-501 REV: B U/M: EA DRAWING NO: ARC-D\1010551
AMP ASSY

SEQ	PART NUMBER	REV	D E S C R I P T I O N	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
0010	1010551	A	ASSY DWG,AMP	EA	REF	ARC-D\1010551	
0020	1010556	B	WIRE LIST,PS ASSY	EA	REF	ARC-A\1010556	
0030	1010567	D	WIRE LIST,LO LEVEL	EA	REF	ARC-A\1010567	
0090	1010072-501	A	PWB ASSY,4 WAY SPLITTER #3	EA	2.000	ARC-D\1010072	A10 ,A11
0100	1007409-501	C	COMBINER ASSY,8 WAY	EA	1.000	ARC-C\1007409	A20
0110	1008595-501	C	PWB ASSY,OPERATE/CONTROL(OCB)	EA	1.000	ARC-C\1008595	A21
0115	1010753-501	-	ASSY,CONTROLLER,50S1G4A	EA	1.000		U2
4200	1011131-501	-	CABLE KIT,AMP ASSY,50S1G4,60S1G3	EA	1.000		
5000	1010554-501	B	PS ASSY	EA	1.000	ARC-D\1010554	1
5010	1010564-501	E	RF,LO LEVEL ASSY	EA	1.000	ARC-D\1010564	2
5020	1010569-501	B	RF ASSY,FINAL	EA	1.000	ARC-D\1010569	3
5025	1010571-501	B	AUX RF LOW LEVEL ASSY	EA	1.000	ARC-B\1010571	4
5030	12048		WASH,LOCK,SPLIT,S/S,#6	EA	54.000	\MS35338-136	5
5050	11018		SCREW,MACH,PAN HD,CROSS-REC,ZN,6-32 X .38,TYPE SW	EA	8.000		6
5060	11023		SCREW,MACH,PAN HD,CROSS-REC,S/S,6-32 X 1	EA	6.000	\MS51957-34	7
5070	11016		SCREW,MACH,PAN HD,CROSS-REC,S/S,6-32 X .38	EA	43.000	\MS51957-28	8
5080	69375	-	SCREWLOCK KIT,METRIC,IEEE-488	EA	1.000	AMP\554808-1	9
5090	69262		SCREWLOCK KIT,F,USE WITH METAL SHELL"D"CONN	EA	1.000	AMP\207952-1	10
5100	11021		SCREW,MACH,PAN HD,CROSS-REC,S/S,6-32 X .62	EA	4.000	\MS51957-31	11
5110	12047		WASH,LOCK,SPLIT,S/S,#4	EA	8.000	\MS35338-135	12
5120	13003		NUT,HEX,S/S,4-40,.187AF	EA	8.000		13
5130	12011		WASH,FLAT,S/S,#6,.312 OD X .156 ID X .035 THK	EA	8.000	\MS15795-805	14
5140	12024		WASH,FLAT,B/ZN PLTG,.312 OD X .164 ID X .125 THK	EA	4.000	\S785-M01-F21-.164	15
5150	11065		SCREW,MACH,FLT HD,100 DEG,CROSS-REC,S/S,6-32 X .50	EA	3.000	\MS24693-C28	16

BILL NO: 1010551-501 REV: B U/M: EA DRAWING NO: ARC-D\1010551
AMP ASSY

SEQ	PART NUMBER	REV	D E S C R I P T I O N	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
5160	1008628-101	-	BRKT,COMBINER,8 WAY	EA	1.000	ARC-B\1008628	17
5170	1008768-101	-	PLATE,ADAPTER,8 WAY	EA	1.000	ARC-B\1008768	18
5190	12010		WASH,FLAT,S/S,#4,.250 OD X .125 ID X .022 THK	EA	2.000	\MS15795-803	20
5200	11010		SCREW,MACH,PAN HD,CROSS-REC,S/S,4-40 X .25	EA	2.000	\MS51957-13	21
5210	11024		SCREW,MACH,PAN HD,CROSS-REC,S/S,6-32 X 1.25	EA	2.000	\MS51957-35	22
5220	14007		SPACER,HEX,NON-THD,.250 HEX X .250 LG X 6 ID	EA	2.000	HHS\2300	23
5230	1010563-301	A	BRKT,SUPPORT	EA	1.000	ARC-C\1010563	24
5240	13004		NUT,HEX,S/S,6-32,.250AF	EA	4.000		25

BILL NO: 1008975-502 REV: - U/M: EA DRAWING NO: ARC-B\1008975
CABLE ASSY,COAX,SEMI-RIGID,SMA,SMA,6.0"

SEQ	PART NUMBER	REV	D E S C R I P T I O N	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
5000	41162		CONN,SMA ST PLUG,SEMI-RIGID COAX	EA	2.000	AEP\9301-7063-009	1
5010	66208	-	WIRE,COAX,SEMI-RIGID,.141 AL-TP/M17 50 OHM	IN	6.000	EZF\810015	2

BILL NO: 1008975-501 REV: - U/M: EA DRAWING NO: ARC-B\1008975
CABLE ASSY,COAX,SEMI-RIGID,SMA,SMA,5.5"

SEQ	PART NUMBER	REV	D E S C R I P T I O N	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
0010	1008975	-	ASSY DWG,CABLE ASSY,COAX SEMI RIGID	EA	REF	ARC-B\1008975	
5000	41162		CONN,SMA ST PLUG,SEMI-RIGID COAX	EA	2.000	AEP\9301-7063-009	1
5010	66208	-	WIRE,COAX,SEMI-RIGID,.141 AL-TP/M17 50 OHM	IN	5.500	EZF\810015	2

BILL NO: 1008976-501 REV: - U/M: EA DRAWING NO: ARC-B\1008976
CABLE ASSY,COAX,SEMI-RIGID,SMA,SMA,3.5"

SEQ	PART NUMBER	REV	D E S C R I P T I O N	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
0010	1008976	-	ASSY DWG,CABLE ASSY,COAX SEMI RIGID	EA	REF	ARC-B\1008976	
5000	41140		CONN,SMA PLUG,SEMI-RIGID COAX	EA	2.000	EFJ\142-0693-051	1
5010	66206		WIRE,COAX,SEMI-RIGID,ALUM,50 OHM	EA	3.200	EZF\EZ-86-AL-TP	2

BILL NO: 1008976-502 REV: - U/M: EA DRAWING NO: ARC-B\1008976
CABLE ASSY,COAX,SEMI-RIGID,SMA,SMA,4.0"

SEQ	PART NUMBER	REV	D E S C R I P T I O N	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
5000	41140		CONN,SMA PLUG,SEMI-RIGID COAX	EA	2.000	EFJ\142-0693-051	1
5010	66206		WIRE,COAX,SEMI-RIGID,ALUM,50 OHM	EA	3.700	EZF\EZ-86-AL-TP	2

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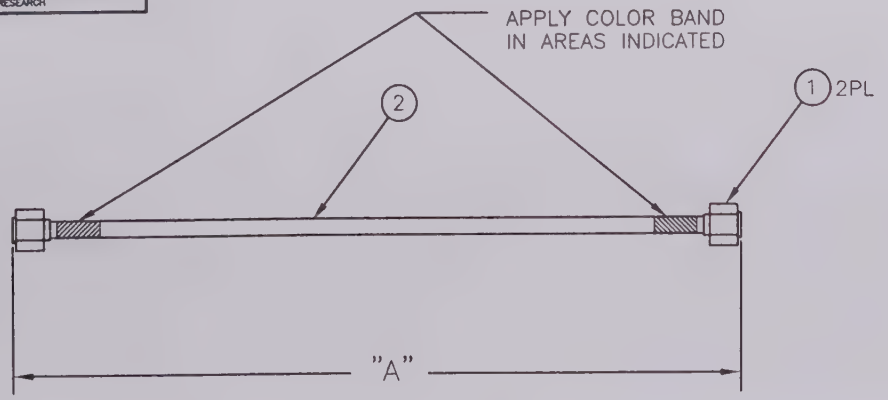
ECN	DATE	REV
REL	21NOV97	–

REL NO
1154-07



DASH NO.	DIM A	COLOR	REV	FOR BOM SEE
-501	8.00	BROWN	–	1008781-501
-502	9.00	RED	–	1008781-502
-503	10.00	ORANGE	–	1008781-503
-504	11.00	YELLOW	–	1008781-504

NOTES:

1.0 "A" DIM IS CRITICAL WITHIN ±0.032.

2.0 APPLY COLOR BAND WITH A PAINT PEN.

3.0 CLEAN COAX BEFORE CONNECTOR INSTALLATION.

ITEM	QTY. REQD.	PART NO.	DESCRIPTION	MARK	FIN	MATL
		PARTS LIST				

UNLESS OTHERWISE SPECIFIED
DO NOT SCALE DRAWING
DIMENSIONS ARE IN INCHES AND INCLUDE PLATING THICKNESS
ALL THREADS ARE UNIFIED NATIONAL SERIES, CLASS 2
REMOVE ALL BURRS AND SHARP EDGES

BASIC DIMENSIONS	2 PLACE DECIMALS	3 PLACE DECIMALS
UP TO 6	±.02	±.005
ABOVE 6 TO 24	±.03	±.010
ABOVE 24	±.06	±.015

ANGULAR DIMENSIONS 1/2°

50S1G4
USED ON MODEL

DRAWN G.JACKSON DATE 29 APR 97
CHKD G.JACKSON DATE 29 APR 97
MECH DATE
ELEC DATE

AMPLIFIER RESEARCH

CABLE ASSY,COAX
SEMI-RIGID,SMA,SMA

DWG. NO. 1008781

SCALE 1/1 | SHEET 1 OF 1 | REV. —

BILL NO: 1008781-501 REV: - U/M: EA DRAWING NO: ARC-B\1008781
CABLE ASSY,COAX,SEMI-RIGID,SMA,SMA,8.0"

SEQ	PART NUMBER	REV	D E S C R I P T I O N	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
0010	1008781	-	ASSY DWG,CABLE ASSY	EA	REF	ARC-B\1008781	
5000	41162		CONN,SMA ST PLUG,SEMI-RIGID COAX	EA	2.000	AEP\9301-7063-009	1
5010	66208	-	WIRE,COAX,SEMI-RIGID,.141 AL-TP/M17 50 OHM	IN	A/R	EZF\810015	2

BILL NO: 1008781-502 REV: - U/M: EA DRAWING NO: ARC-B\1008781
CABLE ASSY,COAX,SEMI-RIGID,SMA,SMA,9.0"

SEQ	PART NUMBER	REV	D E S C R I P T I O N	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
0010	1008781	-	ASSY DWG,CABLE ASSY	EA	REF	ARC-B\1008781	
5000	41162		CONN,SMA ST PLUG,SEMI-RIGID COAX	EA	2.000	AEP\9301-7063-009	1
5010	66208	-	WIRE,COAX,SEMI-RIGID,.141 AL-TP/M17 50 OHM	IN	A/R	EZF\810015	2

BILL NO: 1008781-503 REV: - U/M: EA DRAWING NO: ARC-B\1008781
CABLE ASSY,COAX,SEMI-RIGID,SMA,SMA,10.0"

SEQ	PART NUMBER	REV	D E S C R I P T I O N	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
0010	1008781	-	ASSY DWG,CABLE ASSY	EA	REF	ARC-B\1008781	
5000	41162		CONN,SMA ST PLUG,SEMI-RIGID COAX	EA	2.000	AEP\9301-7063-009	1
5010	66208	-	WIRE,COAX,SEMI-RIGID,.141 AL-TP/M17 50 OHM	IN	A/R	EZF\810015	2

BILL NO: 1008781-504 REV: - U/M: EA DRAWING NO: ARC-B\1008781
CABLE ASSY,COAX,SEMI-RIGID,SMA,SMA,11.0"

SEQ	PART NUMBER	REV	D E S C R I P T I O N	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
0010	1008781	-	ASSY DWG,CABLE ASSY	EA	REF	ARC-B\1008781	
5000	41162		CONN,SMA ST PLUG,SEMI-RIGID COAX	EA	2.000	AEP\9301-7063-009	1
5010	66208	-	WIRE,COAX,SEMI-RIGID,.141 AL-TP/M17 50 OHM	IN	A/R	EZF\810015	2

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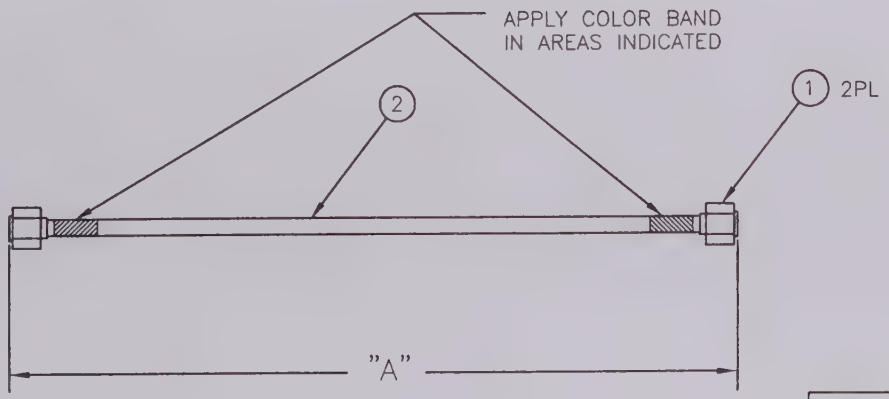
REL NO
1154-07

ECN	DATE	REV
REL	21NOV97	–



DASH NO.	DIM A	COLOR	REV	FOR BOM SEE
-501	10.00	BROWN	–	1008782-501
-502	9.00	RED	–	1008782-502
-503	8.00	ORANGE	–	1008782-503
-504	7.00	YELLOW	–	1008782-504

NOTES:

1.0 "A" DIM IS CRITICAL WITHIN ±0.032.

2.0 APPLY COLOR BAND WITH A PAINT PEN.

3.0 CLEAN COAX BEFORE CONNECTOR INSTALLATION.

ITEM	QTY. REQD.	PART NO.	DESCRIPTION	MARK	FIN	MATL
		PARTS LIST				

UNLESS OTHERWISE SPECIFIED
DO NOT SCALE DRAWING
DIMENSIONS ARE IN INCHES AND INCLUDE PLATING THICKNESS
ALL THREADS ARE UNIFIED NATIONAL SERIES, CLASS 2
REMOVE ALL BURRS AND SHARP EDGES

BASIC DIMENSIONS	2 PLACE DECIMALS	3 PLACE DECIMALS
UP TO 6	±.02	±.005
ABOVE 6 TO 24	±.03	±.010
ABOVE 24	±.06	±.015
ANGULAR DIMENSIONS 1/2°		

50S1G4
USED ON MODEL

DRAWN G.JACKSON DATE 29 APR 97
CHKD G.JACKSON DATE 29 APR 97
MECH DATE
ELEC DATE

AMPLIFIER RESEARCH

CABLE ASSY,COAX SEMI-RIGID,SMA,SMA

DWG. NO. 1008782

SCALE 1/1 | SHEET 1 OF 1 | REV. —

BILL NO: 1008782-501 REV: - U/M: EA DRAWING NO: ARC-B\1008782
CABLE ASSY,COAX,SEMI-RIGID,SMA,SMA,10.0"

SEQ	PART NUMBER	REV	D E S C R I P T I O N	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
0010	1008782	-	ASSY DWG,CABLE ASSY	EA	REF	ARC-B\1008782	
5000	41162		CONN,SMA ST PLUG,SEMI-RIGID COAX	EA	2.000	AEP\9301-7063-009	1
5010	66208	-	WIRE,COAX,SEMI-RIGID,.141 AL-TP/M17 50 OHM	IN	A/R	EZF\810015	2

BILL NO: 1008782-502 REV: - U/M: EA DRAWING NO: ARC-B\1008782
CABLE ASSY,COAX,SEMI-RIGID,SMA,SMA,9.0"

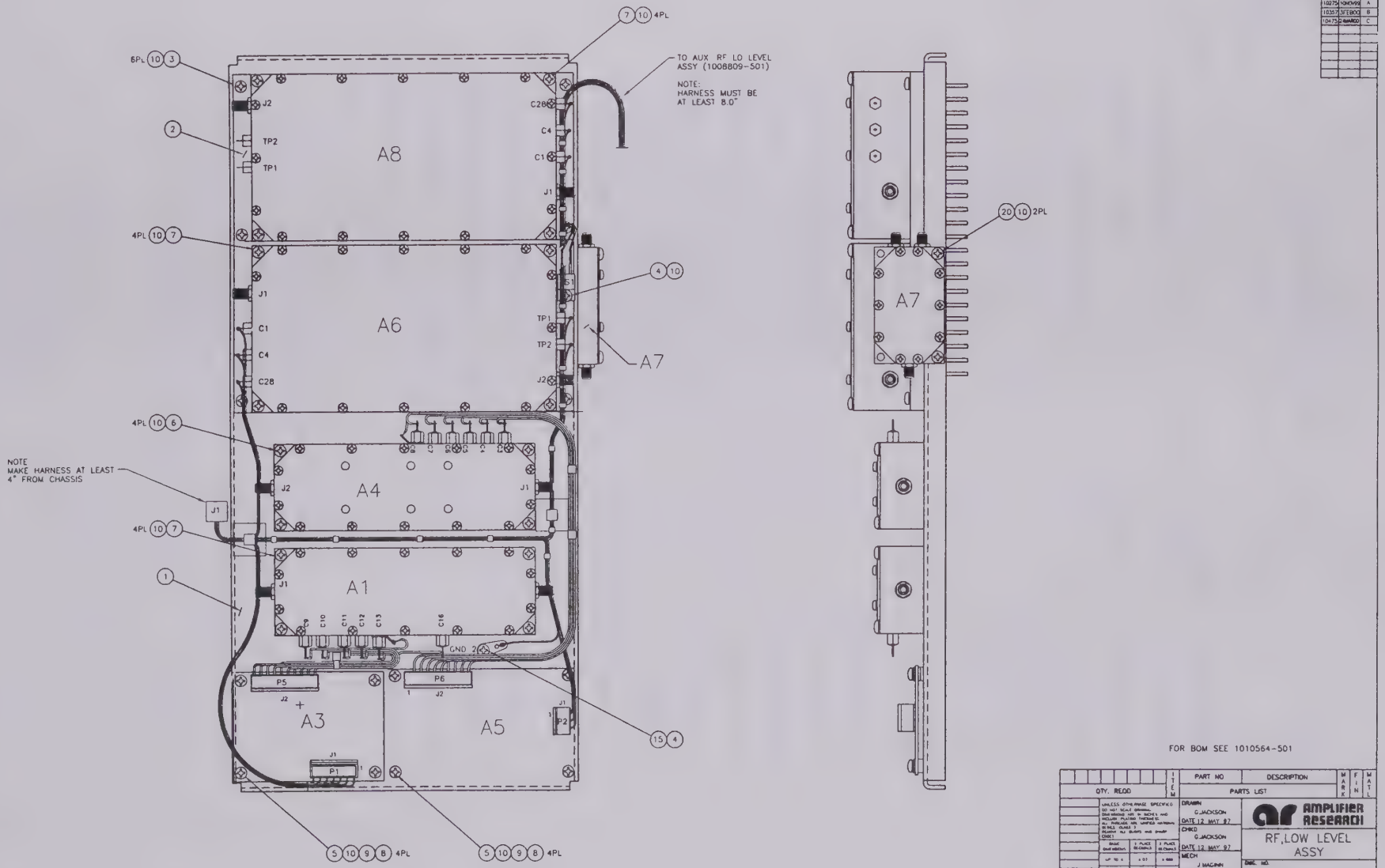
SEQ	PART NUMBER	REV	D E S C R I P T I O N	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
0010	1008782	-	ASSY DWG,CABLE ASSY	EA	REF	ARC-B\1008782	
5000	41162		CONN,SMA ST PLUG,SEMI-RIGID COAX	EA	2.000	AEP\9301-7063-009	1
5010	66208	-	WIRE,COAX,SEMI-RIGID,.141 AL-TP/M17 50 OHM	IN	A/R	EZF\810015	2

BILL NO: 1008782-503 REV: - U/M: EA DRAWING NO: ARC-B\1008782
CABLE ASSY,COAX,SEMI-RIGID,SMA,SMA,8.0"

SEQ	PART NUMBER	REV	D E S C R I P T I O N	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
0010	1008782	-	ASSY DWG,CABLE ASSY	EA	REF	ARC-B\1008782	
5000	41162		CONN,SMA ST PLUG,SEMI-RIGID COAX	EA	2.000	AEP\9301-7063-009	1
5010	66208	-	WIRE,COAX,SEMI-RIGID,.141 AL-TP/M17 50 OHM	IN	A/R	EZF\810015	2

BILL NO: 1008782-504 REV: - U/M: EA DRAWING NO: ARC-B\1008782
CABLE ASSY,COAX,SEMI-RIGID,SMA,SMA,7.0"

SEQ	PART NUMBER	REV	D E S C R I P T I O N	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
0010	1008782	-	ASSY DWG,CABLE ASSY	EA	REF	ARC-B\1008782	
5000	41162		CONN,SMA ST PLUG,SEMI-RIGID COAX	EA	2.000	AEP\9301-7063-009	1
5010	66208	-	WIRE,COAX,SEMI-RIGID,.141 AL-TP/M17 50 OHM	IN	A/R	EZF\810015	2


REL #2022-0
ECN DATE REV
REL 9AUG99 -
10275 10OCT00 A
10357 3FEB00 B
10475 6MAR00 C
7 10 4PL
TO AUX RF LO LEVEL ASSY (1008809-501)
NOTE: HARNESS MUST BE AT LEAST 8.0"
6PL 10 3
2
4PL 10 7
4PL 10 6
4PL 10 7
1
NOTE MAKE HARNESS AT LEAST 4" FROM CHASSIS
J1
A8
A6
A4
A1
A3
A5
A7
J2
TP1
TP2
C1
C4
C28
C2B
J1
4 10
15 4
20 10 2PL
5 10 9 8 4PL
5 10 9 8 4PL
GND 2
P5
P6
P2
P1
FOR BOM SEE 1010564-501
ITEM
QTY. REQD
PART NO
DESCRIPTION
PARTS LIST
MARK
FIN
MATL
DRAWN G.JACKSON DATE 12 MAY 87
CHKD G.JACKSON DATE 12 MAY 87
MECH J MAGINN DATE 8/18/89
ELEC F.SCHIRK DATE 7 AUG 89
AMPLIFIER RESEARCH
RF,LOW LEVEL ASSY
DWG NO. 1010564
SCALE 1/1
SHEET 1 OF 1
REV C
USED ON MODEL
80S1G3
80S1G4A

BILL NO: 1010564-501 REV: E U/M: EA DRAWING NO: ARC-D\1010564
RF,LO LEVEL ASSY

SEQ	PART NUMBER	REV	D E S C R I P T I O N	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
0010	1010564	C	ASSY DWG,RF LOW LEVEL	EA	REF	ARC-D\1010564	
0020	1010567	D	WIRE LIST,LO LEVEL	EA	REF	ARC-A\1010567	
0100	1012337-501	-	PWB ASSY,VARIABLE GAIN AMP/DET	EA	1.000	ARC-D\1012337	A1
0120	1012334-501	A	PWB ASSY,LINEARIZER/CTRL BD	EA	1.000	ARC-B\1012334	A3
0130	1010589-501	C	PWB ASSY,LOW LEVEL "S" MODULE	EA	1.000	ARC-C\1010589	A4
0140	1010748-501	B	PWB ASSY,BIAS CTRL,1W S MODULE	EA	1.000	ARC-C\1010748	A5
0160	1009161-501	L	PWB ASSY,QUAD AMP,100S1G4	EA	2.000	ARC-D\1009161	A6 ,A8
0170	1011164-501	A	PWB ASSY,2 WAY SPLITTER #3	EA	1.000	ARC-B\1011164	A7
3100	57062		SW,TEMP SENSING,N.C.,OPEN AT 70C	EA	1.000	AIR\67L070	S1
5000	1008623-101	B	BRKT,MTG	EA	1.000	ARC-D\1008623	1
5010	1010565-101	A	HEATSINK	EA	1.000	ARC-D\1010565	2
5020	11020		SCREW,MACH,PAN HD,CROSS-REC,S/S,6-32 X .50	EA	6.000	\MS51957-30	3
5030	11014		SCREW,MACH,PAN HD,CROSS-REC,S/S,6-32 X .25	EA	2.000	\MS51957-26	4
5040	11016		SCREW,MACH,PAN HD,CROSS-REC,S/S,6-32 X .38	EA	9.000	\MS51957-28	5
5050	11024		SCREW,MACH,PAN HD,CROSS-REC,S/S,6-32 X 1.25	EA	4.000	\MS51957-35	6
5060	11025		SCREW,MACH,PAN HD,CROSS-REC,S/S,6-32 X 1.50	EA	12.000	\MS51957-36	7
5070	12024		WASH,FLAT,B/ZN PLTG,.312 OD X .164 ID X .125 THK	EA	8.000	\S785-M01-F21-.164	8
5080	12011		WASH,FLAT,S/S,#6,.312 OD X .156 ID X .035 THK	EA	8.000	\MS15795-805	9
5090	12048		WASH,LOCK,SPLIT,S/S,#6	EA	26.000	\MS35338-136	10
5110	1010568-501	B	HARNESS ASSY,LO LEVEL	EA	1.000		12
5140	69100		LUG,SHAKEPROOF,BENT,41/64 L,#6 STUD,DUAL HOLE	EA	2.000	HHS\1416-6	15
5150	69238	-	BASE,MTG,CABLE TIE,ADH BACK,3/4 X 3/4	EA	A/R	TAB\TC-344A	16
5160	11015		SCREW,MACH,PAN HD,CROSS-REC,S/S,6-32 X .31	EA	1.000	\MS51957-27	17
5170	69162		CABLE TIES,7/8 MAX BUNDLE DIA,4 L	EA	A/R	DEN\08432	18

BILL NO: 1010564-501 REV: E U/M: EA DRAWING NO: ARC-D\1010564
RF,LO LEVEL ASSY

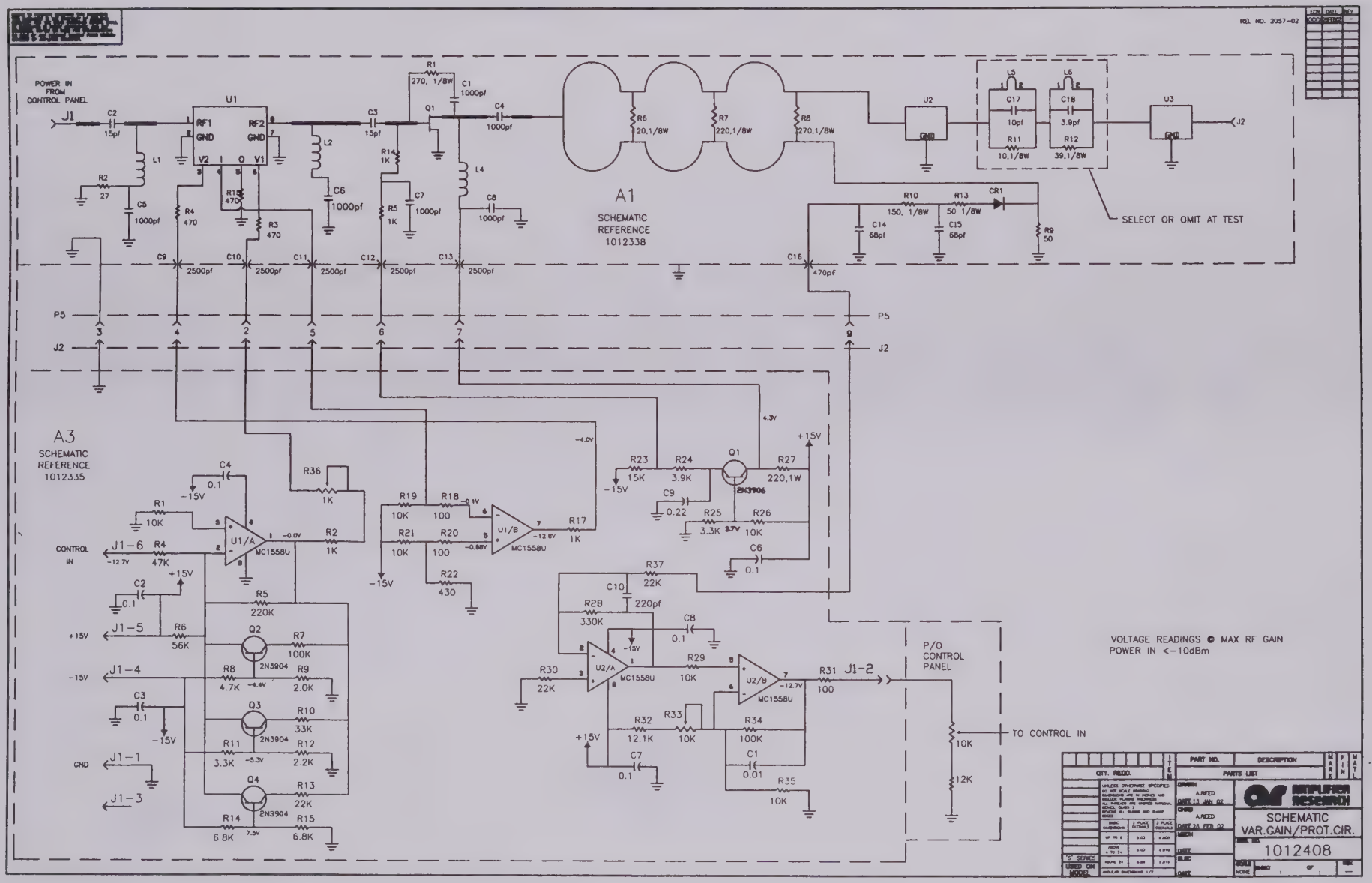
SEQ	PART NUMBER	REV	D E S C R I P T I O N	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
5180	66116		TUBING,SHRINK,BLK,.093 EXP,.046 REC	FT	2.000	REM\F-P301	19
5190	11133		SCREW,MACH,PAN HD,CROSS-REC,S/S,6-32X.875	EA	2.000	\MS51957-33	20

BILL NO: 1010568-501 REV: B U/M: EA DRAWING NO:
HARNESS ASSY,LO LEVEL

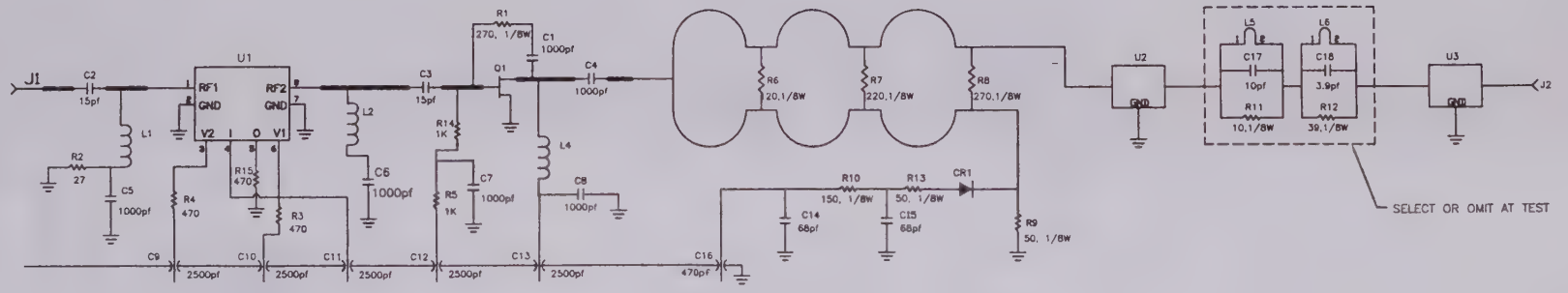
SEQ	PART NUMBER	REV	D E S C R I P T I O N	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
0010	1010552	D	SCHEM DIAG,50S1G4A	EA	REF	ARC-D\1010552	
0020	1010567	D	WIRE LIST,LO LEVEL	EA	REF	ARC-A\1010567	
2200	41103		CONN,PLUG,9 PIN	EA	1.000	MOL\03-09-2092	J1
2210	41107		TERM,.093 DIA,CRIMP TYPE,M,18-22 AWG	EA	9.000	MOL\02-09-2118	J1
2220	41075		CONN,PLUG,6 PIN,(F)	EA	1.000	PNT\CT156F22-6-C	P1
2230	41060		CONN,THRU COVER,6 PIN	EA	1.000	PNT\TC156F-6-C	P1
2240	41074		CONN,PLUG,3 PIN(F)	EA	1.000	PNT\CT156F22-3-C	P2
2250	41059		CONN,THRU COVER,3 PIN	EA	1.000	PNT\TC156F-3-C	P2
2260	41076		CONN,PLUG,10 PIN,(F)	EA	2.000	PNT\CT156F22-10-T	P5 ,P6
2270	41061		CONN,THRU COVER,10 PIN	EA	2.000	PNT\TC156F-10-L	P5 ,P6
5000	66020		WIRE,TFE,18 AWG,STRANDED,TYPE E,BLU	IN	A/R		
5000	66025		WIRE,TFE,22 AWG,STRANDED,TYPE E,BLK	IN	A/R		
5000	66030		WIRE,TFE,22 AWG,STRANDED,TYPE E,GRN	IN	A/R		
5000	66031		WIRE,TFE,22 AWG,STRANDED,TYPE E,BLU	IN	A/R		
5000	66032		WIRE,TFE,22 AWG,STRANDED,TYPE E,VIO	IN	A/R		
5000	66034		WIRE,TFE,22 AWG,STRANDED,TYPE E,WHT	IN	A/R		
5000	66077		WIRE,TFE,22 AWG,STRANDED,TYPE E,WHT/BLK	IN	A/R		
5000	66078		WIRE,TFE,22 AWG,STRANDED,TYPE E,WHT/BRN	IN	A/R		
5000	66079		WIRE,TFE,22 AWG,STRANDED,TYPE E,WHT/RED	IN	A/R		
5000	66081		WIRE,TFE,22 AWG,STRANDED,TYPE E,WHT/YEL	IN	A/R		
5000	66083		WIRE,TFE,22 AWG,STRANDED,TYPE E,WHT/VIO	IN	A/R		

BILL NO: 1010753-501 REV: - U/M: EA DRAWING NO:
ASSY,CONTROLLER,50S1G4A

SEQ	PART NUMBER	REV	D E S C R I P T I O N	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
5000	1010754-101	A	OPERATE CONTROL PROGRAM,50S1G4A	EA	1.000	ARC-A\1010754	
5010	60092		I.C.8 BIT CMOS MICROCONTROLLER	EA	1.000	MRC\P1C16C65A-20/P	U2


REL. NO. 2057-02
POWER IN FROM CONTROL PANEL
J1
U1
A1
SCHEMATIC REFERENCE 1012338
SELECT OR OMIT AT TEST
A3
SCHEMATIC REFERENCE 1012335
CONTROL IN
P/O CONTROL PANEL
TO CONTROL IN
VOLTAGE READINGS @ MAX RF GAIN
POWER IN <-10dBm
SCHEMATIC
VAR.GAIN/PROT.CIR.
1012408

REL NO 2057-02



REFERENCE DESIGNATION TABLE						
LAST DESIGNATION USED						
C18	CR1	J2	L6	Q1	R15	U3
DESIGNATIONS NOT USED						
			L3			

NOTES:
1.0 UNLESS OTHERWISE INDICATED, ALL RESISTORS ARE IN OHMS.

2.0 ALL CAPACITORS ARE IN MICROFARADS, AND ARE 50 VOLTS, UNLESS INDICATED.

ITEM	QTY. REQD.	PART NO.	DESCRIPTION	MARK	FIN	MATL
		PARTS LIST				

DRAWN A.REED DATE 08 JAN 02
CHKD A.REED DATE 08 JAN 02
MECH
CHKD
ELEC
DATE

"S" SERIES
USED ON MODEL:

SCHEMATIC
VARIABLE GAIN AMP/DET

DWG NO. 1012338

SCALE NONE SHEET 1 OF 1 REV —

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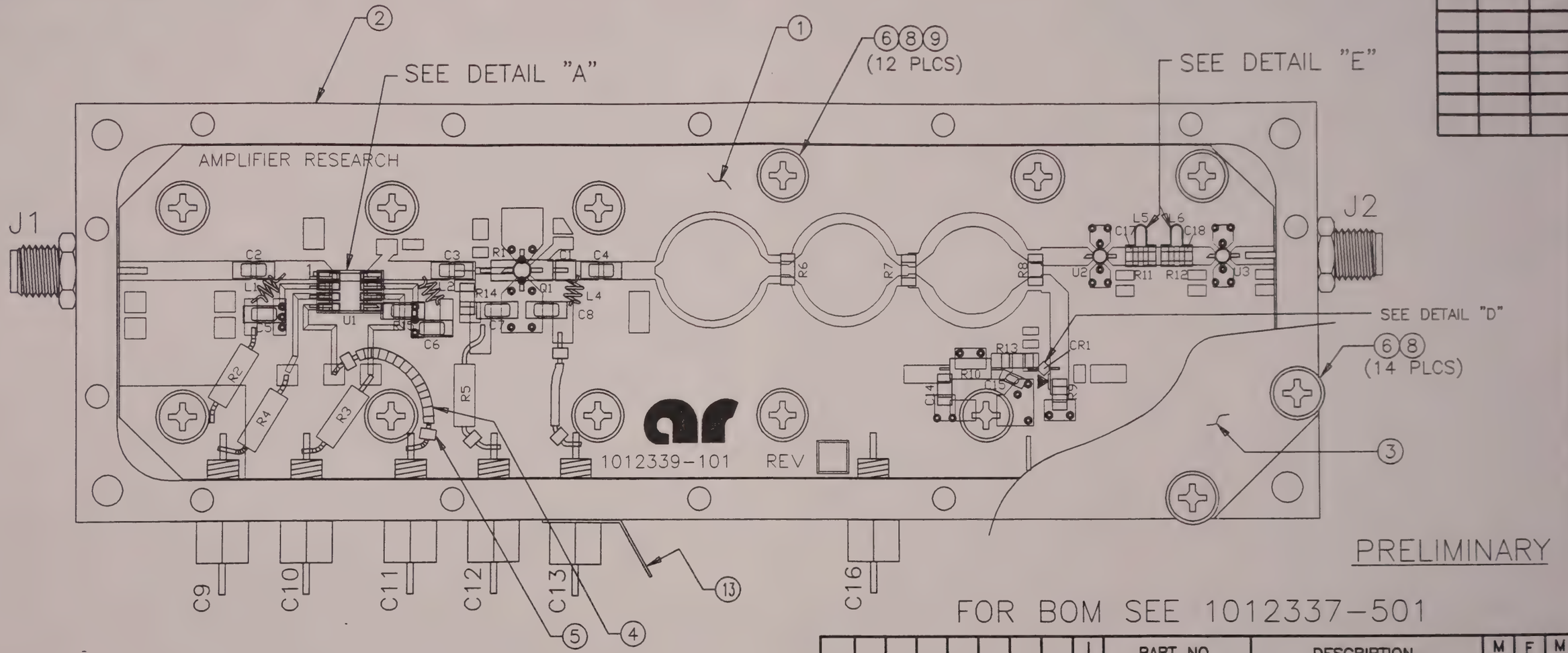
REL NO. 2057-02

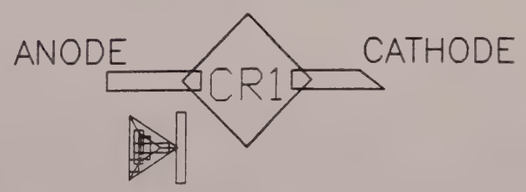
ECN	DATE	REV
XXXXX	28FEB02	–



PRELIMINARY

FOR BOM SEE 1012337-501

DETAIL "D"



ITEM	QTY. REQD.	PART NO.	DESCRIPTION	MARK	FIN	MATL
		PARTS LIST				

UNLESS OTHERWISE SPECIFIED
DO NOT SCALE DRAWING
DIMENSIONS ARE IN INCHES AND INCLUDE PLATING THICKNESS
ALL THREADS ARE UNIFIED NATIONAL SERIES, CLASS 2
REMOVE ALL BURRS AND SHARP EDGES

BASIC DIMENSIONS	2 PLACE DECIMALS	3 PLACE DECIMALS
UP TO 6	±.02	±.005
ABOVE 6 TO 24	±.03	±.010
ABOVE 24	±.06	±.015

ANGULAR DIMENSIONS 1/2°

"S" SERIES
USED ON MODEL

DRAWN J.H.REED DATE 13 FEB 02
CHKD A.REED DATE 28 FEB 02
MECH [signature] DATE 3/1/02
ELEC [signature] DATE 3-1-02

AMPLIFIER RESEARCH

ASSEMBLY DRAWING
VARIABLE GAIN AMP/DET.

DWG. NO. 1012337

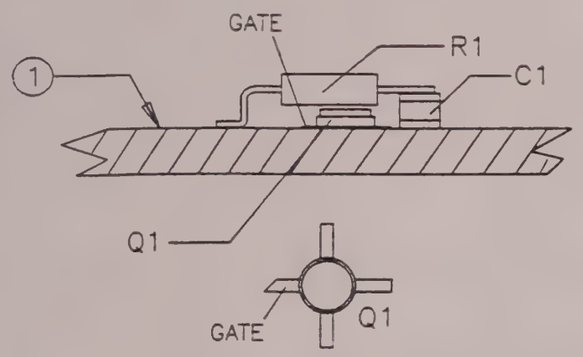
SCALE 2/1 | SHEET 1 OF 2 | REV. —

ECN	DATE	REV
XXXXX	28FEB02	–

REL NO. 2057-02

DETAIL "C"

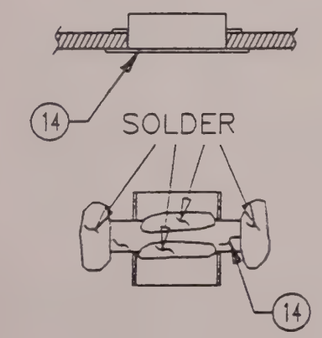
Q1,C1,R1 INSTALLATION



DETAIL "A"

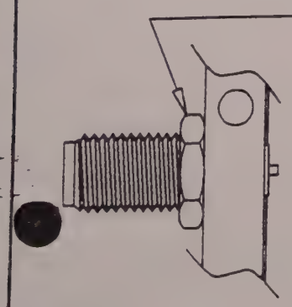
SIDE VIEW
U1, U2

BOTTOM VIEW
U1, U2



DETAIL "B"

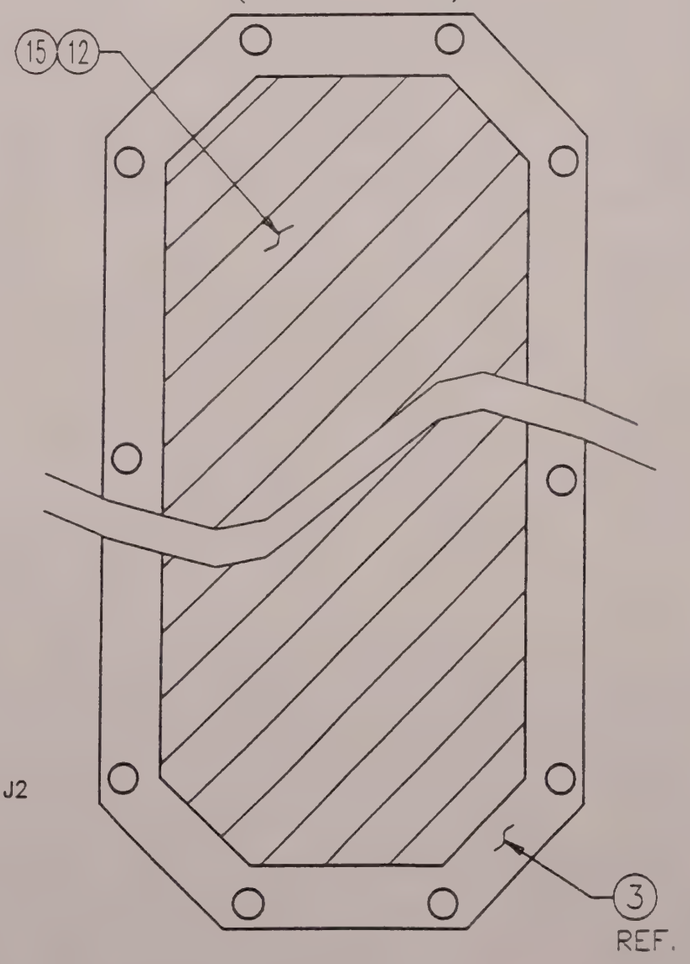
"A"



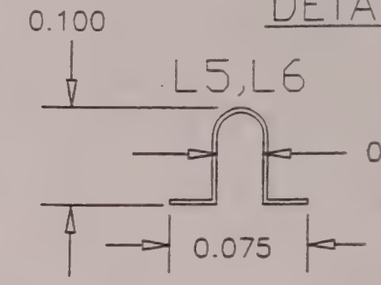
TRIM TEFLON OF PARTS J1, AND J2 FLUSH WITH CONNECTOR BODY. CUT CENTER PIN TO 0.075"(IN) INSTALL CONNECTOR FLUSH WITH INNER HOUSING WALL. TIGHTEN LOCKING NUT "A" SECURELY. (DO NOT USE SUPPLIED WASHER)

BOTTOM VIEW – COVER

(NOT TO SCALE)



DETAIL "E"



MAKE FROM ITEM 14
(CUT IN STRIPS,
50 MILS WIDE)

ASSEMBLY PROCEDURE
VARIABLE GAIN AMP

1) INSTALL U1 TO P.C. BOARD. SOLDER 3 MIL. THICK TINNED BRASS FROM BOTTOM OF U1 TO GROUND PLANE. U1 INSTALLATION MUST BE DONE AT A STATIC APPROVED WORK STATION, SEE DETAIL "A".
2) INSTALL P.C. BOARD INTO HOUSING.
3) INSTALL J1 AND J2, PREPARE J1 AND J2 ACCORDING TO DIMENSIONS SHOWN IN DETAIL "B".
4) INSTALL FEEDTHRU C9 TO C13 INTO HOUSING.
5) INSTALL ALL OF THE CERAMIC CHIP CAPS EXCEPT C1, C17, C18.
6) INSTALL L1 THRU L4.
7) INSTALL R2 TO P.C. BOARD, KEEP LENGTHS AS SHORT AS POSSIBLE.
8) INSTALL R3 THRU R5 AND ITEM #4 (22 AWG SOLID WHITE WIRE) BETWEEN FEEDTHRU AND P.C. BOARD. CUT LEADS AS SHORT AS POSSIBLE.

NOTE: FET INSTALLATION MUST BE DONE AT A STATIC APPROVED WORK STATION. PERSONS MUST BE FAMILIAR WITH THE PROCEDURES. THE FET CAN BE DESTROYED EASILY BOTH ELECTRONICALLY AND MECHANICALLY.

FET INSTALLATION:

1) CUT GATE LEAD TO APPROXIMATELY .075" LONG, THE LEAD MUST BE CUT AT AN ANGLE TO MAINTAIN LEAD IDENTIFICATION.
2) CUT THE SOURCE LEADS AND THE DRAIN LEAD AT APPROXIMATELY .075" LONG.
3) WITH A GROUNDED SOLDERING IRON, SOLDER Q1 INTO THE CIRCUIT.
4) INSTALL CHIP CAP C1 AS SHOWN IN DETAIL "C".
5) INSTALL RESISTOR R1 AS SHOWN IN DETAIL "C".
6) ITEMS C17, C18, R11, R12, L5, L6, U2, AND U3, WILL BE INSTALLED OR OMITTED AT TEST.

PRELIMINARY

DWG. NO. 1012337		
SCALE 2/1	SHEET 2 OF 2	REV. –

BILL NO: 1012337-501 REV: - U/M: EA DRAWING NO: ARC-D\1012337
PWB ASSY,VARIABLE GAIN AMP/DET

SEQ	PART NUMBER	REV	D E S C R I P T I O N	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
0010	1012338	-	SCHEM DIAG,VARIABLE GAIN AMP/DET	EA REF		ARC-D\1012338	
0020	1012337	-	ASSY DWG,VARIABLE GAIN/DET	EA REF		ARC-D\1012337	
0400	27039		CAPR,CHIP,CER,1000pF,10%,50V	EA	6.000	ATC\700B102MCA50X	C1 ,C4 C5 ,C6 C7 ,C8
0410	27031		CAPR,CHIP,15pF,20%,500V	EA	2.000	DIL\C17AH150MATXL	C2 ,C3
0420	27099		CAPR,FEED-THRU,FILT,2500PF,500V	EA	5.000	MET\51-719-011	C9 ,C10 C11 ,C12 C13
0430	27261		CAPR,CHIP,68pF,10%,150V	EA	2.000	ATC\100A680KCA150X	C14 ,C15
0440	27098		CAPR,FEED-THRU,FILT,470PF,10%	EA	1.000	MET\FB2B-471GMV	C16
0450	27029		CAPR,CHIP,10pF,10%,500V	EA REF		DIL\C17AH100K4TXL	C17
0460	27259		CAPR,CHIP,CER,3.9pF,500V	EA REF		ATC\100B3R9CP500X	C18
0700	30039		DIODE,SCHOTTKY,DET,MICRO-WAVE	EA	1.000	H-P\5082-2794	CR1
500	41243		CONN,COAX,BULKHD JACK,SMA,(F)	EA	2.000	DTA\1321000K82165	J1 ,J2
1800	1007507-101	-	INDUCTOR,AIR WOUND,.050ID,34GA,4T	EA	2.000	ARC-A\1007507	L1 ,L4
1810	1007507-103	-	INDUCTOR,AIR WOUND,.050ID,34GA,7T	EA	1.000	ARC-A\1007507	L2
2500	1000034-176	BG	XSTR,RF,LOW NOISE,GaAsFET	EA	1.000	ARC-A\1000034	Q1
2700	55511-2700J		RES,FXD,CARBON COMP,270,5%,1/8W	EA	1.000	A-B\BB2715	R1
2710	55512-27R0J		RES,FXD,CARBON COMP,27,5%,1/4W	EA	1.000	A-B\CB2705	R2
2720	55612-4700J		RES,FXD,METAL FILM,470,5%,1/4-1/2W	EA	2.000	TRW\GP55-4700+/-5%	R3 ,R4
2730	55612-1001J		RES,FXD,METAL FILM,1K,5%,1/4-1/2W	EA	1.000	TRW\GP55-1001+/-5%	R5
2740	55647-1200J		RES,FXD,CHIP,120,5%,1/8W	EA	1.000	D-K\P120-ECT-ND	R6
2750	55647-2200J		RES,FXD,CHIP,220,5%,1/8W	EA	1.000	D-K\P220-ECT-ND	R7
2760	55647-2700J		RES,FXD,CHIP,270,5%,1/8W	EA	1.000	D-K\P270-ECT-ND	R8
2770	55647-51R0J		RES,FXD CHIP,51 OHM,1/8W,5%	EA	2.000	D-K\ P51-ECT-ND	R9 ,R13

[illegible]

[illegible] PAGE 2

[illegible]

[illegible]	PART NUMBER	REV	[illegible]	UM	QUANTITY PER	DRAWING NUMBER	REF DESG
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BILL NO: 1008805-501 REV: - U/M: EA DRAWING NO:
HARNESS ASSY,PRE-AMP\LEVELER

SEQ	PART NUMBER	REV	D E S C R I P T I O N	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
0010	1007691	C	SCHEM DIAG,VAR.GAIN/PROT CKT	EA	REF	ARC-D\1007691	
0020	1008803	A	WIRE LIST,PREAMP\LEVELER	EA	REF	ARC-A\1008803	
2200	41076		CONN,PLUG,10 PIN,(F)	EA	1.000	PNT\CT156F22-10-T	P5
2210	41061		CONN,THRU COVER,10 PIN	EA	1.000	PNT\TC156F-10-L	P5
5000	66025		WIRE,TFE,22 AWG,STRANDED,TYPE E,BLK	IN	A/R		
5000	66030		WIRE,TFE,22 AWG,STRANDED,TYPE E,GRN	IN	A/R		
5000	66031		WIRE,TFE,22 AWG,STRANDED,TYPE E,BLU	IN	A/R		
5000	66032		WIRE,TFE,22 AWG,STRANDED,TYPE E,VIO	IN	A/R		
5000	66034		WIRE,TFE,22 AWG,STRANDED,TYPE E,WHT	IN	A/R		
5000	66083		WIRE,TFE,22 AWG,STRANDED,TYPE E,WHT/VIO	IN	A/R		

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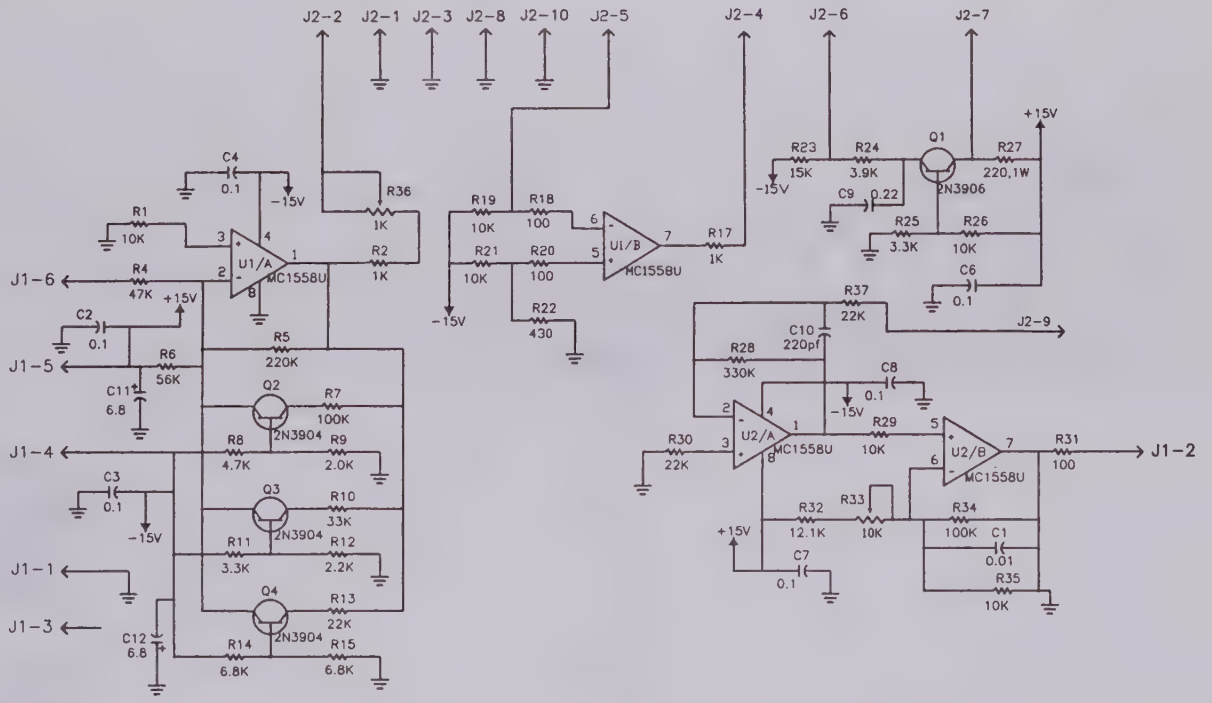
REL NO. 2057-02

ECN	DATE	REV
XXXXX	28FEB02	–



REFERENCE DESIGNATION TABLE			
LAST DESIGNATION USED			
R37	C12	Q4	U2
DESIGNATIONS NOT USED			
	C5		

ITEM	QTY. REQD.	PART NO.	DESCRIPTION	MARK	FIN	MATL
		PARTS LIST				

UNLESS OTHERWISE SPECIFIED
DO NOT SCALE DRAWING
DIMENSIONS ARE IN INCHES AND INCLUDE PLATING THICKNESS
ALL THREADS ARE UNIFIED NATIONAL SERIES, CLASS 2
REMOVE ALL BURRS AND SHARP EDGES

BASIC DIMENSIONS	2 PLACE DECIMALS	3 PLACE DECIMALS
UP TO 6	±.02	±.005
ABOVE 6 TO 24	±.03	±.010
ABOVE 24	±.06	±.015

ANGULAR DIMENSIONS 1/2°

'S' SERIES USED ON MODEL

DRAWN A.REED DATE 07 JAN 02
CHKD A.REED DATE 28 FEB 02
MECH DATE
ELEC DATE

AMPLIFIER RESEARCH

SCHEMATIC
LINEARIZER CONTROL

DWG. NO. 1012335

SCALE 1/2 | SHEET 1 OF 1 | REV. —

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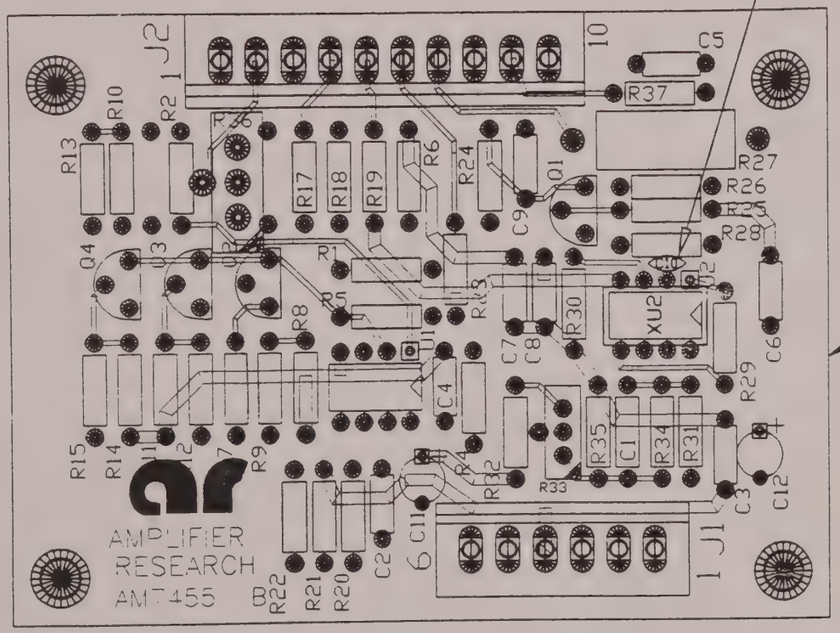
REL NO 2057-02

ECN	DATE	REV
XXXX	28FEB02	–



NOTES:

1.0 SOLDER C10 ACROSS R28.
2.0 TRIM LEADS ON J1 AND J2.

FOR BOM SEE 1012334-501

QTY. REQD.	ITEM	PART NO.	DESCRIPTION	MARK	FIN	MATL
		PARTS LIST				

UNLESS OTHERWISE SPECIFIED
DO NOT SCALE DRAWING
DIMENSIONS ARE IN INCHES AND INCLUDE PLATING THICKNESS
ALL THREADS ARE UNIFIED NATIONAL SERIES, CLASS 2
REMOVE ALL BURRS AND SHARP EDGES

BASIC DIMENSIONS	2 PLACE DECIMALS	3 PLACE DECIMALS
UP TO 6	±.02	±.005
ABOVE 6 TO 24	±.03	±.010
ABOVE 24	±.06	±.015
ANGULAR DIMENSIONS 1/2°		

'S' SERIES
USED ON MODEL

DRAWN A.REED DATE 07 JAN 02
CHKD A.REED DATE 28 FEB 02
MECH J. Magin DATE 3/1/02
ELEC DATE 3-1-02

AMPLIFIER RESEARCH

PWB ASSY
LINEARIZER/CONTROL

DWG. NO. 1012334

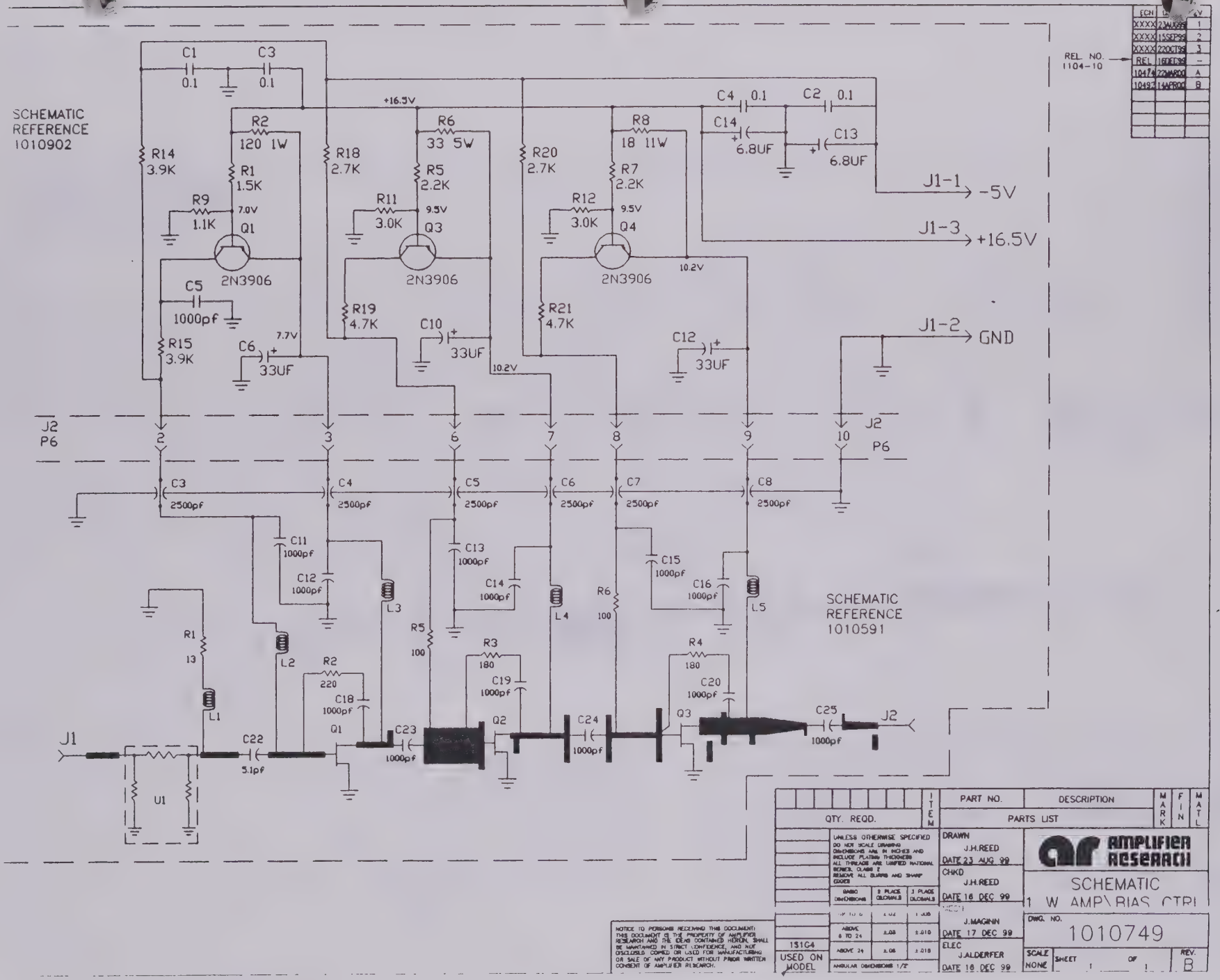
SCALE NONE | SHEET 1 OF 1 | REV. —

BILL NO: 1012334-501 REV: A U/M: EA DRAWING NO: ARC-B\1012334
PWB ASSY,LINEARIZER/CTRL BD

SEQ	PART NUMBER	REV	D E S C R I P T I O N	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
0010	1012335	-	SCHEM DIAG,LINEARIZER/CTRL	EA	REF	ARC-D\1012335	
0020	1012334	-	ASSY DWG,LINEARIZER/CTRL BD	EA	REF	ARC-B\1012334	
0400	27189		CAPR,CER,0.01uF,20%,500V	EA	1.000	SPR\5GAS-S10	C1
0410	27236		CAPR,FXD,DIP SPACED CER,.1UF,50VDC	EA	6.000	AVX\MD015C104MAA	C2 ,C3 C4 ,C6 C7 ,C8
0420	27210		CAPR,CER,0.22uF,50V	EA	1.000	CRL\CW30C224K	C9
0430	27183		CAPR,CER,220pF,10%,500/1000V	EA	1.000	CRL\DD221	C10
0440	27055		CAPR,TANT,6.8UF,50V	EA	2.000	MAL\TDC685K050NLF	C11 ,C12
1500	41083		CONN,LOCKING HEADER,STR,6 PIN	EA	1.000	PNT\MLSS156-6-C	J1
1510	41084		CONN,LOCKING HEADER,STR,10 PIN,SQR POSTS	EA	1.000	PNT\MLSS156-10-L	J2
2500	2N3906		XSTR,SWNG,PNP,40V,0.2A,1W	EA	1.000	ARE\2N3906	Q1
2510	2N3904		XSTR,SWNG,NPN,40V,0.2A,1W	EA	3.000		Q2 ,Q3 Q4
2700	55612-1002J		RES,FXD,METAL FILM,10K,5%,1/4-1/2W	EA	6.000	TRW\GP55-1002+/-5%	R1 ,R19 R21 ,R26 R29 ,R35
2710	55612-1001J		RES,FXD,METAL FILM,1K,5%,1/4-1/2W	EA	2.000	TRW\GP55-1001+/-5%	R2 ,R17
2720	55612-4702J		RES,FXD,METAL FILM,47K,5%,1/4-1/2W	EA	1.000	TRW\GP55-4702+/-5%	R4
2730	55612-2203J		RES,FXD,METAL FILM,220K,1%,1/4-1/2W	EA	1.000	TRW\GP55-2203+1-5%	R5
2740	55612-5602J		RES,FXD,METAL FILM,56K,5%,1/4-/12W	EA	1.000	TRW\GP55-5602+/-5%	R6
2745	55612-1003J		RES,FXD,METAL FILM,100K,5%,1/4-1/2W	EA	2.000	TRW\GP55-1003+/-5%	R7 ,R34
2750	55612-4701J		RES,FXD,METAL FILM,4.7K,5%,1/4-1/2W	EA	1.000	TRW\GP55-4701+/-5%	R8
2760	55612-2001J		RES,FXD,METAL FILM,2.0K,5%,1/4-1/2W	EA	1.000	TRW\GP55-2001+/-5%	R9
2770	55612-3302J		RES,FXD,METAL FILM,33K,5%,1/4-1/2W	EA	1.000	TRW\GP55-3302+/-5%	R10
2780	55612-3301J		RES,FXD,METAL FILM,3.3K,5%,1/4-1/2W	EA	2.000	TRW\GP55-3301+/-5%	R11 ,R25
2790	55612-2201J		RES,FXD,METAL FILM,2.2K,5%,1/4-1/2W	EA	1.000	TRW\GP55-2201+/-5%	R12

BILL NO: 1012334-501 REV: A U/M: EA DRAWING NO: ARC-B\1012334
PWB ASSY,LINEARIZER/CTRL BD

SEQ	PART NUMBER	REV	D E S C R I P T I O N	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
2800	55612-2202J		RES,FXD,METAL FILM,22K,5%,1/4-1/2W	EA	3.000	TRW\GP55-2202+/-5%	R13 ,R30 R37
2810	55612-6801J		RES,FXD,METAL FILM,6.8K,5%,1/4-1/2W	EA	2.000	TRW\GP55-6801+/-5%	R14 ,R15
2830	55612-1000J		RES,FXD,METAL FILM,100,5%,1/4-1/2	EA	3.000	TRW\GP55-1000+/-5%	R18 ,R20 R31
2835	55612-4300J		RES,FXD,METAL FILM,430,5%,1/4-1/2W	EA	1.000	TRW\GP55-4300+/-5%	R22
2840	55612-1502J		RES,FXD,METAL FILM,15K,5%,1/4-1/2W	EA	1.000	TRW\GP55-1502+/-5%	R23
2850	55612-3901J		RES,FXD,METAL FILM,3.9K,5%,1/4-1/2W	EA	1.000	TRW\GP55-3901+/-5%	R24
2860	55514-2200J		RES,FXD,CARBON COMP,220,5%,1W	EA	1.000	A-B\GB2215	R27
2870	55612-3303J		RES,FXD,METAL FILM,330K,5%,1/4-/12W	EA	1.000	TRW\GP55-3303+/-5%	R28
2890	55612-1212F		RES,FXD,METAL FILM,12.1K,1%,1/4-1/2W	EA	1.000		R32
2900	55919		RES,VAR,CERMET,MULTITURN,TOP ADJ,10K,10%,1/2W	EA	1.000	BOR\3299Y-1-103	R33
2910	55917		RES,VAR,CERMET,MULTITURN,TOP ADJ,1K,10%,1W	EA	1.000	MEP\RJ24FW102	R36
3700	60039		INTEGRATED CKT,DUAL OP AMP	EA	2.000	MOT\MC1558U	U1 ,U2
4500	73010		SOCKET,I.C.,8 PIN,DIP	EA	2.000	TII\C93-08-02	XU1 ,XU2
5000	1007455-101	D	PWB,LINEARIZER/CTRL BD	EA	1.000	ARC-B\1007455	1
5010	66041		WIRE,TFE,26 AWG,STRANDED,TYPE E,WHT	IN	A/R		2



ECN		LTR
XXXX	23AUG99	1
XXXX	15SEP99	2
XXXX	22OCT99	3
REL	16DEC99	–
10474	22MAR00	A
10493	14APR00	B

REL. NO. 1104-10

QTY. REQD.	ITEM	PART NO.	DESCRIPTION	MARK	FIN	MATL
		PARTS LIST				

UNLESS OTHERWISE SPECIFIED
DO NOT SCALE DRAWING
DIMENSIONS ARE IN INCHES AND INCLUDE PLATING THICKNESS
ALL THREADS ARE UNIFIED NATIONAL (UNC/N, CLASS 2)
REMOVE ALL BURRS AND SHARP EDGES

BASIC DIMENSIONS	3 PLACE DECIMALS	2 PLACE DECIMALS
UP TO 6	±.002	±.005
ABOVE 6 TO 24	±.005	±.010
ABOVE 24	±.05	±.010

ANGULAR DIMENSIONS 1/2°

DRAWN J.H.REED DATE 23 AUG 99
CHKD J.H.REED DATE 16 DEC 99
ENGR J.MAGNIN DATE 17 DEC 99
ELEC J.ALDERFER DATE 16 DEC 99

AMPLIFIER RESEARCH

SCHEMATIC
1 W AMP\BIAS CTRL

DWG. NO. 1010749

SCALE NONE SHEET 1 OF 1 REV. B

USED ON MODEL 1310C4

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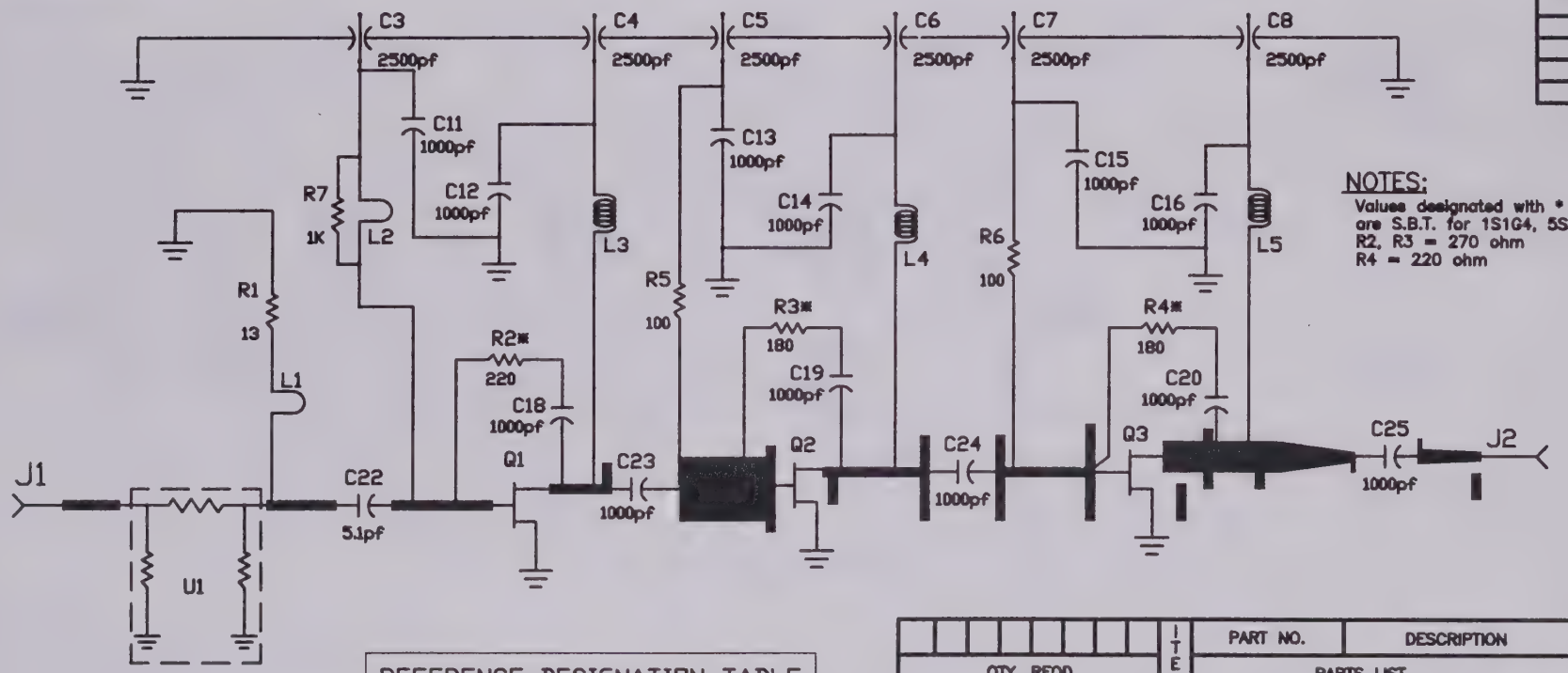
ECN	DATE	REV
XXXX	18MAY99	1
XXXX	15SEP99	2
REL	16DEC99	–
10852	28MAR01	A

REL. NO. 1104-10



NOTES:
Values designated with * are S.B.T. for 1S1G4, 5S1G4.
R2, R3 = 270 ohm
R4 = 220 ohm

REFERENCE DESIGNATION TABLE			
LAST DESIGNATION USED			
Q3	C25	L6	R7
DESIGNATIONS NOT USED			
	C1,C2,C9,C10, C17,C21		

QTY. REQD.	ITEM	PART NO.	DESCRIPTION	MARK	FIN.	MATL
		PARTS LIST				

UNLESS OTHERWISE SPECIFIED
DO NOT SCALE DRAWING
DIMENSIONS ARE IN INCHES AND INCLUDE PLATING THICKNESS
ALL THREADS ARE UNIFIED NATIONAL SERIES, CLASS 2
REMOVE ALL BURRS AND SHARP EDGES

BASIC DIMENSIONS	2 PLACE DECIMALS	3 PLACE DECIMALS
UP TO 6	±.02	±.005
ABOVE 6 TO 24	±.03	±.010
ABOVE 24	±.06	±.015

ANGULAR DIMENSIONS 1/2°

1S1G4
USED ON MODEL

DRAWN J.H.REED DATE 18 MAY 99
CHKD J.H.REED DATE 16 DEC 99
MECH J.MAGINN DATE 17 DEC 99
ELEC J.ALDERFER DATE 16 DEC 99

AMPLIFIER RESEARCH

SCHEMATIC
LOW LEVEL "S" MODULE

DWG. NO. 1010591

SCALE NONE | SHEET 1 OF 1 | REV. A

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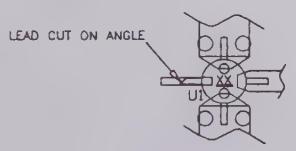
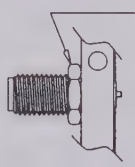
ECN	DATE	REV
–	15SEP99	1
–	03DEC99	2
REL	19JAN00	–
10492	14APR00	A
10607	12JUL00	B
10673	25SEP00	C

REL. NO. 1113-09

DETAIL "A"

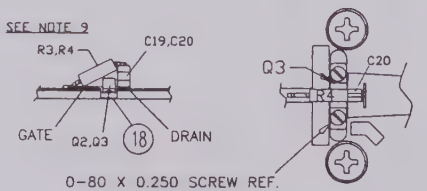


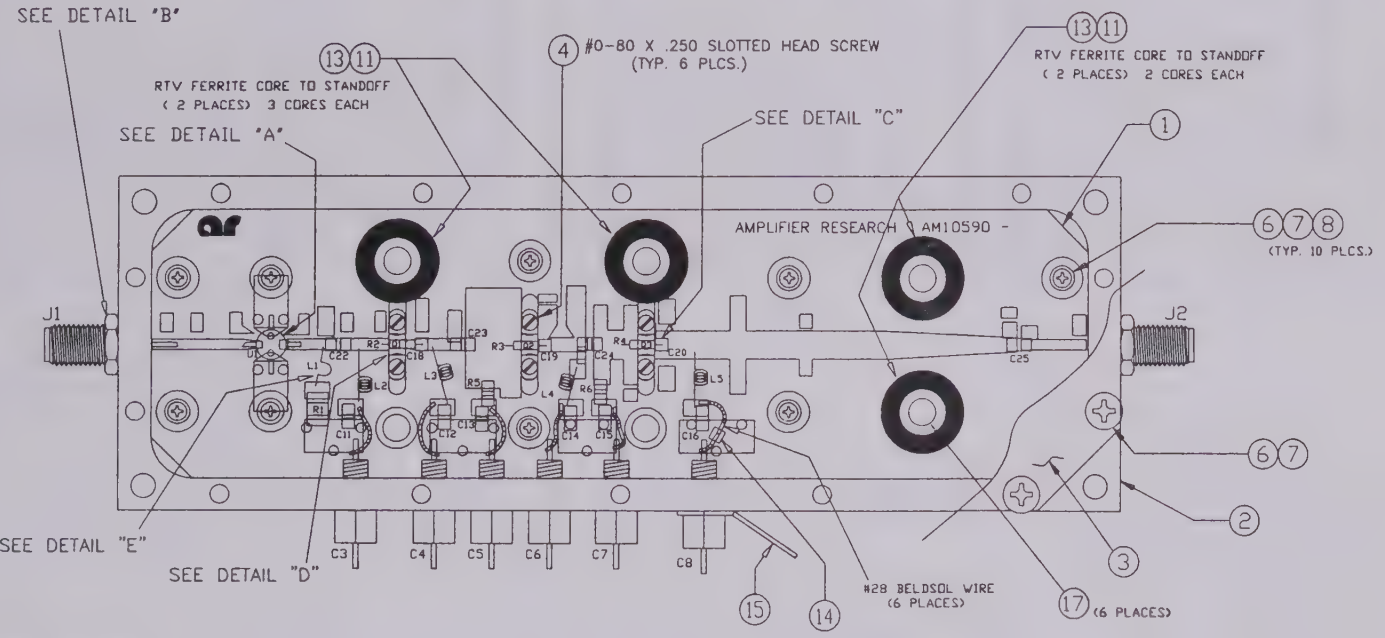
DETAIL "B"



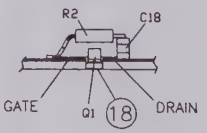
TRIM TEFLON OF PARTS J1 & J2 FLUSH WITH CONNECTOR BODY. CUT CENTER PIN TO 0.075"(IN) INSTALL CONNECTOR FLUSH WITH INNER HOUSING WALL. TIGHTEN LOCKING NUT "A" SECURELY. (DO NOT USE SUPPLIED WASHER)

DETAIL "C"

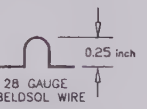




DETAIL "D"



DETAIL "E"



ASSEMBLY PROCEDURE
1 WATT AMP

1) INSTALL P.C. BOARD INTO HOUSING - CENTER MOUNTING SCREW HOLES IN SLOTS FOR Q1, Q2 AND Q3.
2) TEMPORARILY USE MOUNTING HARDWARE TO HOLD BOARD IN PLACE PRIOR TO INSTALLING STANDOFFS, ITEM 17 AT COMPLETION.
3) INSTALL CONNECTOR J1 AND J2 INTO HOUSING.
NOTE: SEE DETAIL "B".
4) INSTALL FEEDTHRU C3 THRU C8 INTO HOUSING.
5) INSTALL R1, R5, R6 (WITH FACE VALUE DOWN).
6) INSTALL ALL OF THE CERAMIC CHIP CAPS EXCEPT C18, C19, AND C20.
7) INSTALL L1 THRU L5, INSTALL L1 AS SHOWN(CLOSE TO C22).
8) INSTALL #28 BELDSOL JUMPER WIRES BETWEEN FEEDTHRU AND P.C. BOARD.

NOTE: THE FOLLOWING FET INSTALLATION MUST BE DONE AT A STATIC APPROVED WORK STATION. PERSONS HANDLING AND INSTALLING THE FET'S MUST BE FAMILIAR WITH THE PROCEDURE THE FET CAN BE DESTROYED BOTH ELECTRICALLY AND MECHANICALLY.

9) FET INSTALLATION,(GATE LEADS OF Q1-Q3 MUST FACE TOWARD J1).
NOTE: STEPS 1 THRU 6 ABOVE MUST BE COMPLETED BEFORE INSTALLING FETS.
(a) INSTALL SHIM P/N 1011381-101, UNDER Q1, Q2, AND Q3.
(b) INSTALL 0-80 SCREWS TO HOLD Q1-Q3, CIRCUIT. TIGHTEN SCREWS, THEN LOOSEN 1/4 TURN BEFORE SOLDERING.
10) INSTALL FEEDBACK CAPACITORS C18, C19, AND C20 .
11) INSTALL FEEDBACK RESISTOR R2 AT Q1 PER DETAIL "D".
12) INSTALL FEEDBACK RESISTORS R3 AND R4 TO Q2 AND Q3 PER DETAIL "C".
13) TIGHTEN SCREWS ON Q1 - Q3.

FOR BOM, SEE 1010589-501

ITEM QTY. REQD.	PART NO. / DESCRIPTION	MARK	FIN	MATL
	PARTS LIST			

UNLESS OTHERWISE SPECIFIED DO NOT SCALE DRAWING DIMENSIONS ARE IN INCHES AND INCLUDE PLATING THICKNESS ALL THREADS ARE UNIFIED NATIONAL SERIES, CLASS 2 REMOVE ALL BURRS AND SHARP EDGES

BASIC DIMENSIONS	2 PLACE DECIMALS	3 PLACE DECIMALS
UP TO 6	±.02	±.005
ABOVE 6 TO 24	±.03	±.010
ABOVE 24	±.08	±.015

ANGULAR DIMENSIONS 1/2°

DRAWN	J.H.REED DATE 15 SEPT 99
CHKD	J.H.REED DATE 19 JAN 00
MECH	J.MAGINN DATE 27 JAN 00
ELEC	J.ALDERFER DATE 27 JAN 00

AMPLIFIER RESEARCH

ASSEMBLY
PWB, 1 WATT AMP

DWG. NO. 1010589

SCALE 2/1 | SHEET 1 OF 1 | REV. C

10S1G4
USED ON MODEL

BILL NO: 1010589-501 REV: C U/M: EA DRAWING NO: ARC-C\1010589
PWB ASSY,LOW LEVEL "S" MODULE

SEQ	PART NUMBER	REV	D E S C R I P T I O N	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
0010	1010591	A	SCHEM DIAG,LOW LEVEL "S" MODULE	EA	REF	ARC-B\1010591	
0020	1010589	D	ASSY DWG,LOW LEVEL "S" MODULE	EA	REF	ARC-C\1010589	
0400	27099		CAPR,FEED-THRU,FILT,2500PF,500V	EA	6.000	MET\51-719-011	C3 ,C4 C5 ,C6 C7 ,C8
0410	27039		CAPR,CHIP,CER,1000pF,10%,50V	EA	12.000	ATC\700B102MCA50X	C11 ,C12 C13 ,C14 C15 ,C16 C18 ,C19 C20 ,C23 C24 ,C25
0420	27024		CAPR,CHIP,5.1pF,0.5%,500V	EA	1.000	DIL\C17AH5R1D500NT	C22
1500	41243		CONN,COAX,BULKHD JACK,SMA,(F)	EA	2.000	DTA\1321000K82165	J1 ,J2
1800	66052		WIRE,MAGNET,SOLDERABLE,28 AWG,GRN	EA	2.000		L1 ,L2
1810	1007507-102	-	INDUCTOR,AIR WOUND,.050ID,34GA,5T	EA	3.000	ARC-A\1007507	L3 ,L4 L5
[illegible]00	1000034-183	BJ	XSTR,RF,LOW NOISE,GaAsFET	EA	1.000	ARC-A\1000034	Q1
2510	1000034-184	BJ	XSTR,RF,MED PWR,GaAsFET	EA	1.000	ARC-A\1000034	Q2
2520	1000034-185	BJ	XSTR,RF,MED PWR,GaAsFET	EA	1.000	ARC-A\1000034	Q3
2700	55649-13R0J		RES,FXD,CHIP,13,5%,1W	EA	1.000	D-K\P13XCT-ND	R1
2710	55511-2200J		RES,FXD,CARBON COMP,220,5%,1/8W	EA	1.000	A-B\BB2215	R2
2720	55511-1800J		RES,FXD,CARBON COMP,180,5%,1/8W	EA	2.000	A-B\BB1815	R3 ,R4
2730	55647-1000J		RES,FXD CHIP,100 OHM,1/8W,5%	EA	2.000	D-K\P100-ECT-ND	R5 ,R6
2740	55647-1001J		RES,FXD,CHIP,1K,1/8,5%	EA	1.000	D-K\P1.0K-ECT-ND	R7
3700	25069		ATTEN,FXD,2dB,1W,70 MIL PKG	EA	1.000	MIN\PAT-2	U1
5000	1011767-101	A	PWB,1 WATT AMP	EA	1.000	ARC-B\1011767	1
5010	1010548-101	-	HSG,LOW LEVEL "S" MODULE	EA	1.000	ARC-D\1010548	2
5020	1010757-101	-	COVER,LOW LEVEL 1W AMP,S MODULE	EA	1.000	ARC-B\1010757	3

BILL NO: 1010589-501 REV: C U/M: EA DRAWING NO: ARC-C\1010589
PWB ASSY,LOW LEVEL "S" MODULE

SEQ	PART NUMBER	REV	D E S C R I P T I O N	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
5030	11145		SCREW,MACH,FIL HD,SLOTTED,0-80 X .25	EA	6.000		4
5050	11010		SCREW,MACH,PAN HD,CROSS-REC,S/S,4-40 X .25	EA	24.000	\MS51957-13	6
5060	12047		WASH,LOCK,SPLIT,S/S,#4	EA	24.000	\MS35338-135	7
5070	12010		WASH,FLAT,S/S,#4,.250 OD X .125 ID X .022 THK	EA	10.000	\MS15795-803	8
5090	66054		WIRE,MAGNET,SOLDERABLE,28 AWG,RED	IN	A/R		10
5100	1000643-612	C	CORE,FERRITE,TOROID,3E2A	EA	10.000	ARC\1000643	11
5120	77066		ADH,RTV,SELF-LVL,CLEAR	EA	A/R	G-E\GE118	13
5130	1000643-401	C	CORE,FERRITE,BEAD	EA	1.000	ARC\1000643	14
5140	69101		LUG,SOLDER,BENT TONGUE,3/4 L,3/8 OD,1/4 STUD	EA	1.000	HHS\1496	15
5160	69429		SPACER,RND,M-F,A,1/4 OD x .625 L x 4-40	EA	6.000	RAF\4036-440-A	17
5170	1011381-101	-	SPACER,PWB	EA	3.000	ARC-B\1011381	18

BILL NO: 1008806-501 REV: C U/M: EA DRAWING NO:
HARNESS ASSY,1 WATT AMP

SEQ	PART NUMBER	REV	D E S C R I P T I O N	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
0010	1010749	B	SCHEM DIAG,BIAS CTRL	EA	REF	ARC-C\1010749	
0020	1010458	B	WIRE LIST,MODEL 100S1G4,1 WATT AMP	EA	REF	ARC-A\1010458	
2200	41076		CONN,PLUG,10 PIN,(F)	EA	1.000	PNT\CT156F22-10-T	P1
2210	41061		CONN,THRU COVER,10 PIN	EA	1.000	PNT\TC156F-10-L	P1
5000	66025		WIRE,TFE,22 AWG,STRANDED,TYPE E,BLK	IN	A/R		
5000	66030		WIRE,TFE,22 AWG,STRANDED,TYPE E,GRN	IN	A/R		
5000	66031		WIRE,TFE,22 AWG,STRANDED,TYPE E,BLU	IN	A/R		

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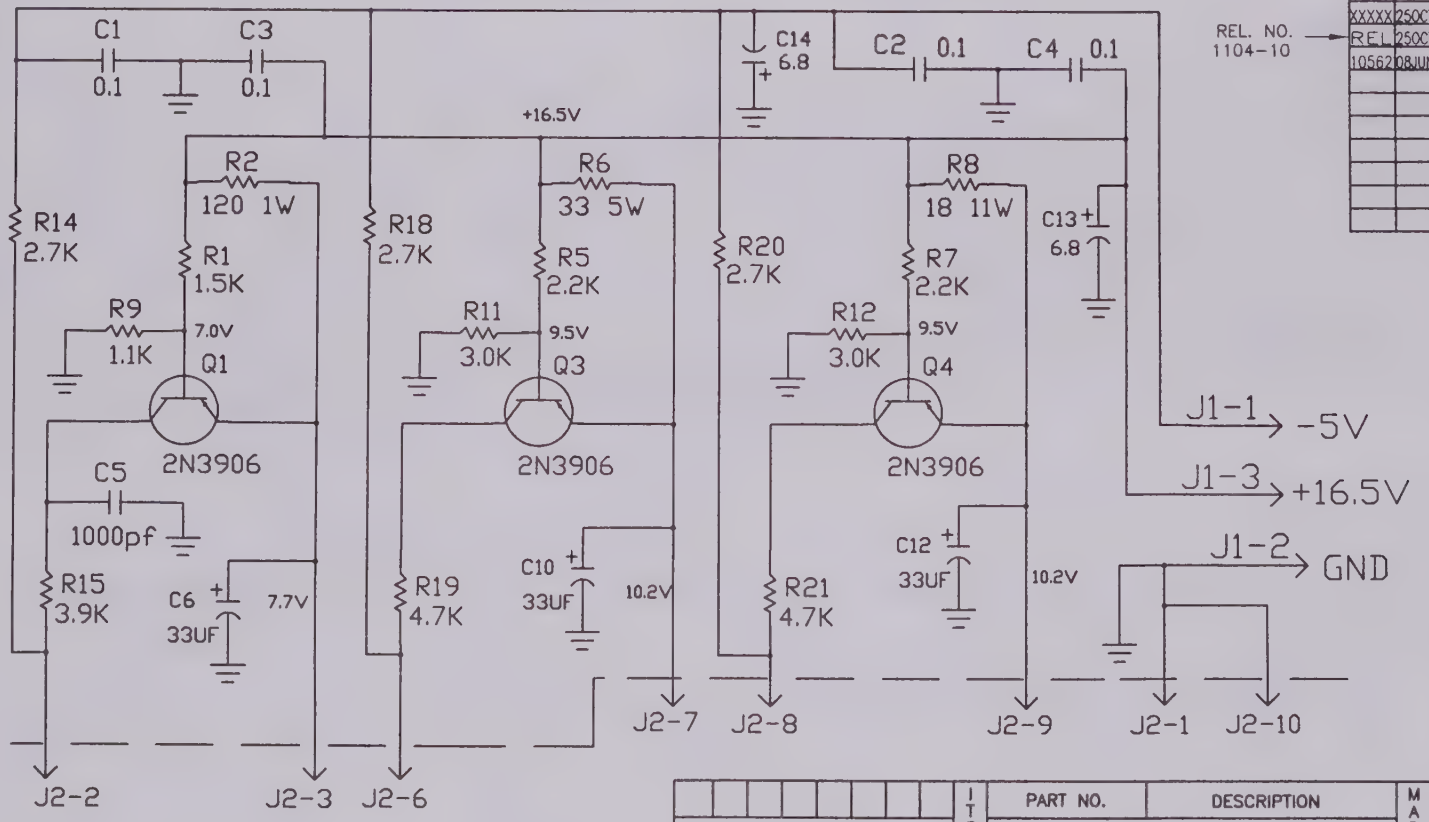

ECN	DATE	REV
XXXXX	25OCT99	1
REL	25OCT99	–
10562	08JUN00	A

REL. NO. 1104-10

NOTES:

1.0 UNLESS OTHERWISE INDICATED, ALL RESISTORS ARE IN OHMS, 1/4 WATT, AND 5% TOLERANCE.

2.0 ALL CAPACITORS ARE IN MICROFARADS, AND ARE 50 VOLTS, UNLESS INDICATED.

REFERENCE DESIGNATION TABLE		
LAST DESIGNATION USED		
C14	Q4	R21
DESIGNATIONS NOT USED		
C7,8,9,11	Q2	R3,4,10,13,16,17

ITEM	QTY. REQD.	PART NO.	DESCRIPTION	MARK	FIN	MATL
		PARTS LIST				

UNLESS OTHERWISE SPECIFIED
DO NOT SCALE DRAWING
DIMENSIONS ARE IN INCHES AND INCLUDE PLATING THICKNESS
ALL THREADS ARE UNIFIED NATIONAL SERIES, CLASS 2
REMOVE ALL BURRS AND SHARP EDGES

BASIC DIMENSIONS	2 PLACE DECIMALS	3 PLACE DECIMALS
UP TO 6	±.02	±.005
ABOVE 6 TO 24	±.03	±.010
ABOVE 24	±.06	±.015

ANGULAR DIMENSIONS 1/2°

1S1G4
USED ON MODEL

DRAWN J.H.REED DATE 25 OCT 99
CHKD J.H.REED DATE 16 DEC 99
MECH J.MAGINN DATE 17 DEC 99
ELEC J.ALDERFER DATE 16 DEC 99

AMPLIFIER RESEARCH

SCHEMATIC
BIAS CONTROL

DWG. NO. 1010902

SCALE NONE | SHEET 1 OF 1 | REV. A

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ECN	DATE	REV
XXXX	09DEC97	1
REL	28JUL98	–
9561	02SEP98	A
9786	26APR99	B
10117	19AUG99	C
10328	09DEC99	D
10480	14APR00	E

RELEASE NO. 1176-01

U1 L200CV 60033

+16.5V +13.5V -5V +10.8V +10.5V +10.1V 13.4V 8.0V

C1 0.039, C2 100UF, C3 1000pf, C4 0.039, C5 1000pf, C6 1000pf, C7 0.039, C8 0.039, C9 1000pf, C10 1000pf, C11 1000pf, C12 1000pf, C13 0.039, C14 0.039, C15 1000pf, C16 1000pf, C17 5.1, C18 5.1, C20 1000pf, C21, C22, C23 0.039, C24 0.039, C25 0.039, C26 100, C27 0.039, C28, C29 200pf, C30 200pf, C31 1.0, C32 33, C33 33

R1 0.2,5W, R2 120, R3 1.5K, R4 3.3K, R5 2.7,11W, R6 680, R7 500,1W CW, R8 3.3K, R9 4.53K, R10 1.1K, R11 1.8K, R12 1.1K, R13 1.8K, R14 4.53K, R15 1.5K, R16 2.7,11W, R17 50, R18 50, R19 51, R20 51, R21 1K, R22 1K, R23 13, R24 13, R25 1K, R26 1K, R27 1.8K, R28 3.9K, R29 5.6K, R30 1K, R31 680

Q1 2N3904, Q2 2N3906, Q3, Q4, Q5 2N3906

VR1 1N5230A 4.7V

CR1, DS1

U2 90° QUAD, U3 90° QUAD, U4/A, U4/B, U4/C, U4/D

L1, L2, L5, L6

J1, J2, TP1, TP2

FAULT OUT (FAULT=0)

QTY. REQD.	ITEM	PART NO.	DESCRIPTION	MARK	FIN	MATL
		PARTS LIST				

UNLESS OTHERWISE SPECIFIED
DO NOT SCALE DRAWING
DIMENSIONS ARE IN INCHES AND INCLUDE PLATING THICKNESS
ALL THREADS ARE UNIFIED NATIONAL SERIES, CLASS 2
REMOVE ALL BURRS AND SHARP EDGES

BASIC DIMENSIONS	2 PLACE DECIMALS	3 PLACE DECIMALS
UP TO 6	±.02	±.005
ABOVE 6 TO 24	±.03	±.010
ABOVE 24	±.06	±.015
ANGULAR DIMENSIONS 1/2°		

DRAWN	J.H.REED
DATE	09 DEC 97
CHKD	J.H.REED
DATE	28 JULY 98
MECH	J.MAGINN
DATE	30 JULY 98
ELEC	F.SCHIRK
DATE	30 JULY 98

100S1G4
USED ON MODEL

AMPLIFIER RESEARCH

SCHEMATIC
QUAD AMP

DWG. NO. 1009163

SCALE NONE | SHEET 1 OF 1 | REV. E

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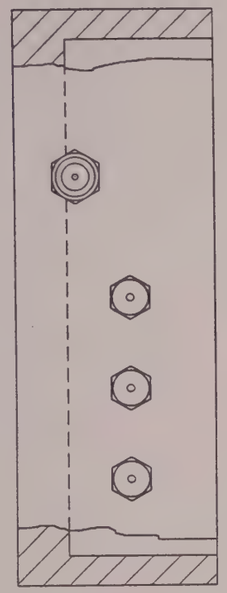
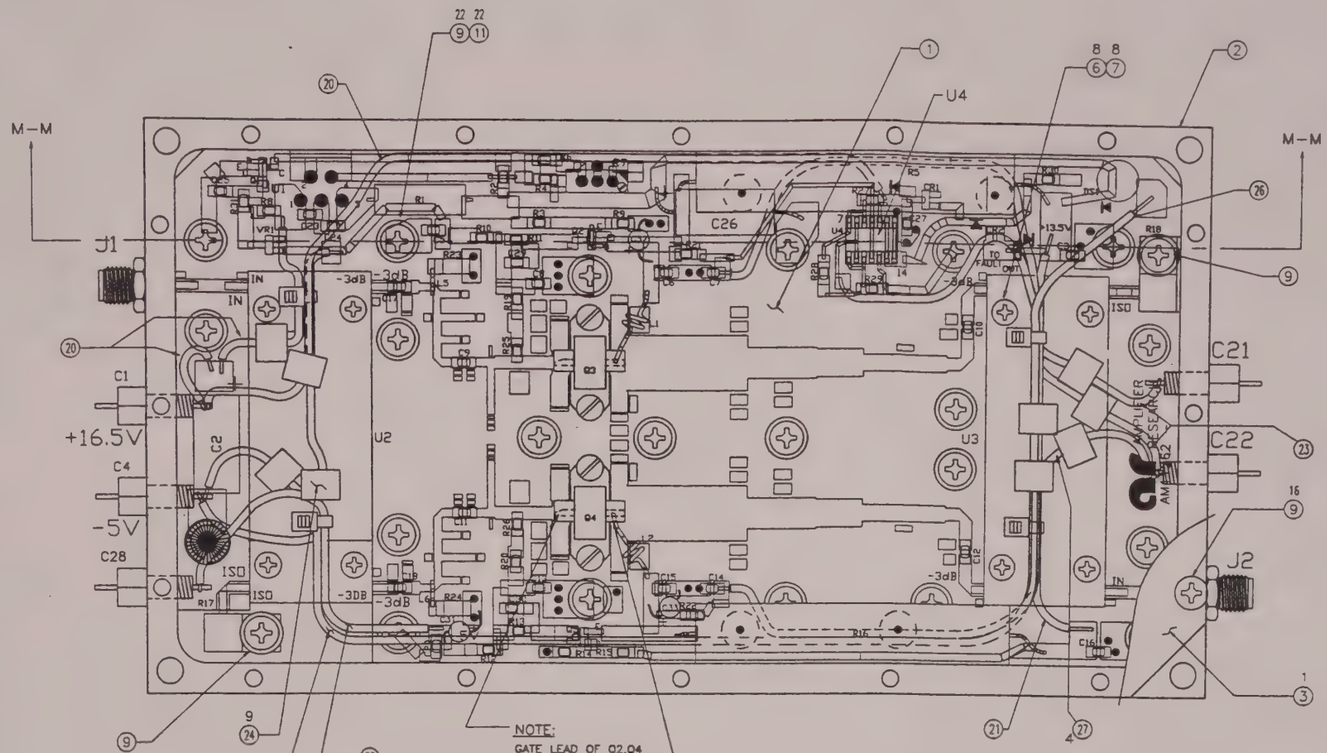
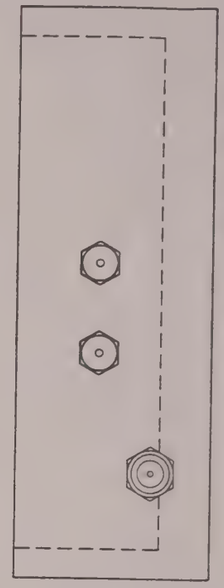
RELEASE NO. 1176-01

ECN	DATE	REV
XXXX	09JUL97	1
XXXX	16JUN98	2
RE...	28JUL98	–
9561	07SEP98	A
9788	26APR99	B
10117	19AUG99	C
10311	03DEC99	D
10425	28FEB00	E
10480	14APR00	F
10755	12JAN01	G
10920	16MAY01	H







NOTES:

1.0 INSTALL PWB INTO HOUSING, CENTER THE CUTOUT FOR THE FET'S OVER THE 2–56 MOUNTING SCREW HOLES.

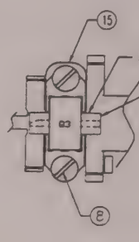
2.0 TIGHTEN ALL MOUNTING SCREWS FOR THE PWB BEFORE BEGINNING INSTALLATION OF COMPONENTS.

3.0 INSTALL ALL COMPONENTS INTO HOUSING BEFORE FET INSTALLATION. THIS MUST BE DONE LAST.

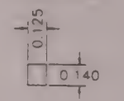
CAUTION

4.0 THE FET INSTALLATION MUST BE DONE AT A STATIC APPROVED WORK STATION. PERSONS HANDLING AND INSTALLING THE FET'S, MUST BE FAMILAR WITH GaAs FET HANDLING PROCEDURES. THE GaAs FET CAN BE DESTROYED, ELECTRICALLY AND MECHANICALLY.

5.0 DO NOT PUSH THE GATE OR DRAIN LEADS DOWN TO THE P.C.BOARD WHEN INSTALLING THE FET. USE SOLDER TO FILL THE AREA BETWEEN THE LEAD AND THE P.C. BOARD.

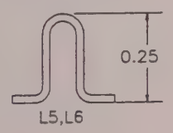


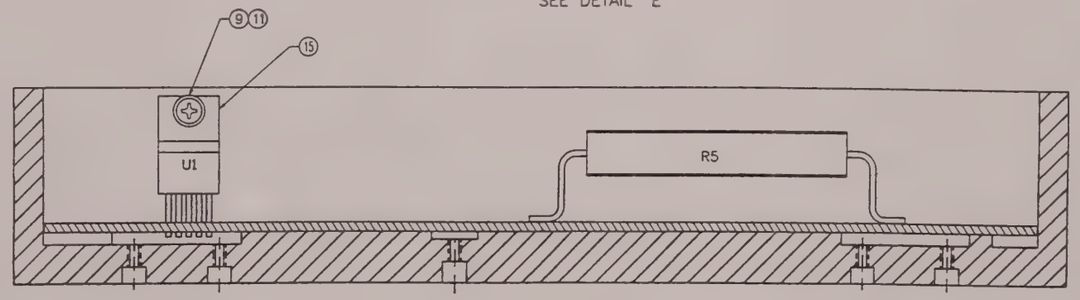
DETAIL "E"



NOTE:
ADD PIECE OF ITEM 25 (0.003" THK BRASS SHIM STOCK) TINNED ON BOTH SIDES TO TOP OF THE GATE AND DRAIN LEADS OF Q3, Q4.

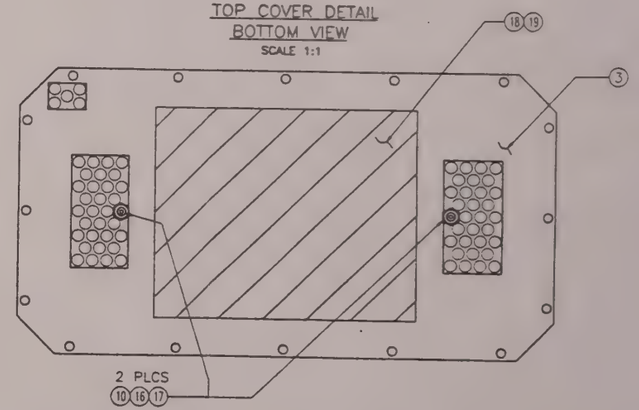
DETAIL "C"
NOT TO SCALE

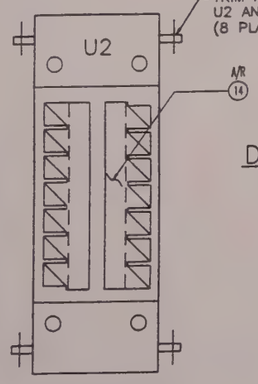




SECTION M – M

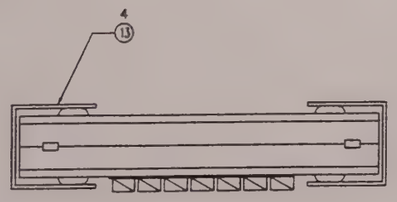
TOP COVER DETAIL
BOTTOM VIEW
SCALE 1:1





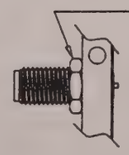
BOTTOM VIEW OF U2 & U3

DETAIL "A"



SIDE VIEW OF U2 & U3

DETAIL "B"



TRIM TEFLON OF PARTS J1, AND J2 FLUSH WITH CONNECTOR BODY. CENTER PIN TO 0.075"(IN) INSTALL CONNECTOR FLUSH WITH INNER HOUSING WALL, TIGHTEN LOCKING NUT "A" SECURELY. (DO NOT USE SUPPLIED WASHER)

DETAIL "D"
NOT TO SCALE

FOR BOM SEE: 1009161-501

ITEM	QTY. REQD.	PART NO.	DESCRIPTION	MARK	FIN	MATL
		PARTS LIST				

USED ON MODEL
120S1G4
60S1G4
50S1G4
30S1G4
25S1G4
10S1G4
100S1G4

UNLESS OTHERWISE SPECIFIED
DO NOT SCALE DRAWING
DIMENSIONS ARE IN INCHES AND INCLUDE PLATING THICKNESS
ALL THREADS ARE UNIFIED NATIONAL SERIES, CLASS 3
REMOVE ALL BURRS AND SHARP EDGES

BASIC DIMENSIONS	2 PLACE DECIMALS	3 PLACE DECIMALS
UP TO 6	±.02	±.005
ABOVE 6 TO 24	±.03	±.010
ABOVE 24	±.06	±.015

ANGULAR DIMENSIONS ±1/2

DRAWN	J.H.REED
DATE	10 DEC 97
CHKD	J.H.REED
DATE	28 JULY 98
MECH	J.MACINN
DATE	30 JULY 98
ELEC	F.SCHIRK
DATE	30 JULY 98

AMPLIFIER RESEARCH

ASSEMBLY
QUAD AMP

DWG. NO. 1009161

SCALE NONE | SHEET 1 OF 1 | REV. H

BILL NO: 1009161-501 REV: L U/M: EA DRAWING NO: ARC-D\1009161
PWB ASSY,QUAD AMP,100S1G4

SEQ	PART NUMBER	REV	D E S C R I P T I O N	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
0010	1009163	E	SCHEM DIAG,QUAD AMP,100S1G4	EA	REF	ARC-C\1009163	
0020	1009161	H	ASSY DWG,QUAD AMP	EA	REF	ARC-D\1009161	
0400	27099		CAPR,FEED-THRU,FILT,2500PF,500V	EA	5.000	MET\51-719-011	C1 ,C4 C21 ,C22 C28
0410	27068		CAPR,ELECT,100uF,50VDC,AXIAL	EA	2.000	ICI\107TTA050M	C2 ,C26
0420	27039		CAPR,CHIP,CER,1000pF,10%,50V	EA	10.000	ATC\700B102MCA50X	C3 ,C5 C6 ,C9 C10 ,C11 C12 ,C15 C16 ,C20
0425	27251		CAPR,CHIP,0.039uF,20%,50V	EA	8.000	ATC\200B393MP50	C7 ,C8 C13 ,C14 C23 ,C24 C25 ,C27
0430	27024		CAPR,CHIP,5.1pF,0.5%,500V	EA	2.000	DIL\C17AH5R1D500NT	C17 ,C18
0450	27028		CAPR,CHIP,200pF,1%,300V	EA	2.000	DIL\C17AH201F3TXL	C29 ,C30
0460	27047		CAPR,TANT,1UF,50V	EA	1.000	MAL\TDC105K050WSE	C31
0470	27051		CAPR,TANT,33UF,35VDC,EPOXY	EA	2.000	AVX\TAP336K035HSB	C32 ,C33
0700	30044		DIODE,SW,30mA,SM	EA	1.000	D-K\MA704ACT-ND	CR1
1000	33003		LED,RED,T1 3/4(5mm)	EA	1.000	H-P\HLMP-3001-009	DS1
1500	41243		CONN,COAX,BULKHD JACK,SMA,(F)	EA	2.000	DTA\1321000K82165	J1 ,J2
1800	1007507-105	-	INDUCTOR,AIR WOUND,.125ID,28GA,2T	EA	2.000	ARC-A\1007507	L1 ,L2
1810	66251		WIRE,BUSS,TINNED COPPER,28 AWG	IN	A/R	WEI\9028	L5 ,L6
2500	54561		XSTR,NPN,GEN PURPOSE	EA	1.000	MOT\MMBT3904LT1	Q1
2510	54562		XSTR,PNP,GEN PURPOSE	EA	2.000	MOT\MMBT3906LT1	Q2 ,Q5
2520	1000034-182A	BL	XSTR,RF,PWR,GaAsFET,SELECTED	EA	2.000	ARC\1000034	Q3 ,Q4
2700	55715-R180J		RES,FXD,WW,0.18,5%,2W,TYPE SPH	EA	1.000		R1
2705	55647-1200J		RES,FXD,CHIP,120,5%,1/8W	EA	1.000	D-K\P120-ECT-ND	R2

BILL NO: 1009161-501 REV: L U/M: EA DRAWING NO: ARC-D\1009161
PWB ASSY,QUAD AMP,100S1G4

SEQ	PART NUMBER	REV	D E S C R I P T I O N	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
2720	55647-1501F		RES,FXD,CHIP,1.5K,1%,1/8W	EA	2.000	D-K\P1.5K-FCT-ND	R3 ,R15
2730	55647-3301J		RES,FXD,CHIP,3.3K,5%,1/8W	EA	2.000	D-K\P3.3K-ECT-ND	R4 ,R8
2740	55724-2R70J		RES,FXD,WW,2.7,5%,11W	EA	2.000	OHM\90J2R7	R5 ,R16
2750	55647-6800J		RES,FXD,CHIP,680,5%,1/8W	EA	2.000	D-K\P680-ECT-ND	R6 ,R31
2760	55916		RES,VAR,CERMET,MULTITURN,TOP ADJ,500,10%,1W	EA	1.000	MEP\8024EKW-501	R7
2780	55647-4531F		RES,FXD,CHIP,4.53K,1%,1/8W	EA	2.000	D-K\P4.53K-FCT-ND	R9 ,R14
2790	55647-1101J		RES,FXD,CHIP,1.1K,5%,1/8W	EA	2.000	D-K\P1.1K-FCT-ND	R10 ,R12
2795	55647-1801J		RES,FXD,CHIP,1.8K,5%,1/8W	EA	3.000	D-K\P1.8K-ECT-ND	R11 ,R13 R27
2800	56072		RES,FXD,PRECISION,FLANGE,MOUNT,50	EA	2.000	RFP\RFP-20-50TP	R17 ,R18
2810	55647-51R0J		RES,FXD CHIP,51 OHM,1/8W,5%	EA	2.000	D-K\ P51-ECT-ND	R19 ,R20
2815	55647-1001J		RES,FXD,CHIP,1K,1/8,5%	EA	5.000	D-K\P1.0K-ECT-ND	R21 ,R22 R25 ,R26 R30
2820	55649-13R0J		RES,FXD,CHIP,13,5%,1W	EA	2.000	D-K\P13XCT-ND	R23 ,R24
2840	55647-3901J		RES,FXD,CHIP,3.9K,5%,1/8W	EA	1.000	D-K\P3.9K-ECT-ND	R28
2850	55647-5601J		RES,FXD,CHIP,5.6K,5%,1/8W	EA	1.000	D-K\P5.6K-ECT-ND	R29
3700	60033		INTEGRATED CKT,LINEAR,POS.,ADJ.V,2A	EA	1.000	SGS\L200CV	U1
3710	25046		COUPLER,90 DEG,HYBRID	EA	2.000	RFP\102-422-90-200	U2 ,U3
3720	60135		IC,LINEAR QUAD COMPARATOR,SM	EA	1.000	NSI\LM339AM	U4
4000	30043		DIODE,ZENER,4.7V,SM	EA	1.000	D-K\MA3047CT-ND	VR1
5000	1011262-101	B	PWB,QUAD AMP	EA	1.000	ARC-C\1011262	1
5010	1009165-101	B	HSG,QUAD AMP	EA	1.000	ARC-D\1009165	2
5020	1009164-101-M1	B	COVER,QUAD AMP	EA	1.000	ARC-C\1009164	3
5050	11166		SCREW,MACH,PAN HD,CROSS-REC,S/S,2-56 X .50	EA	8.000		6
5060	12005		WASH,LOCK,SPLIT,S/S,#2	EA	8.000	\MS35338-134	7

BILL NO: 1009161-501 REV: L U/M: EA DRAWING NO: ARC-D\1009161
PWB ASSY,QUAD AMP,100S1G4

SEQ	PART NUMBER	REV	D E S C R I P T I O N	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
5070	11084		SCREW,MACH,PAN HD,CROSS-REC,S/S,2-56 X .18	EA	4.000	\MS51957-2	8
5080	11202		SEM,MACH SCREW,PHP W/SPLIT LK WASH,S.S.,4-40x.25	EA	41.000		9
5090	12047		WASH,LOCK,SPLIT,S/S,#4	EA	2.000	\MS35338-135	10
5100	12010		WASH,FLAT,S/S,#4,.250 OD X .125 ID X .022 THK	EA	23.000	\MS15795-803	11
5120	1007919-101	A	SHIELD,RF	EA	4.000	ARC-B\1007919	13
5130	69338		CONTACT,FINGER STOCK,TWIST GASKET,TIN PL	IN	A/R	I-S\OSG8-0559-17	14
5140	77064		COMPOUND,THERMAL JOINT,TYPE 120	OZ	A/R	WAK\120-S	15
5150	11095		SCREW,MACH,PAN HD,CROSS-REC,S/S,4-40 X .62	EA	2.000	\MS51957-18	16
5160	13013		NUT,HEX,S/S,4-40,.250AF	EA	2.000	\MS35649-244	17
5170	69332		FOAM,CONDUCTIVE	IN	A/R	MMM\2802	18
5180	77066		ADH,RTV,SELF-LVL,CLEAR	OZ	A/R	G-E\GE118	19
5190	66027		WIRE,TFE,22 AWG,STRANDED,TYPE E,RED	EA	A/R		20
5200	66031		WIRE,TFE,22 AWG,STRANDED,TYPE E,BLU	EA	A/R		21
5210	66032		WIRE,TFE,22 AWG,STRANDED,TYPE E,VIO	EA	A/R		22
5220	66034		WIRE,TFE,22 AWG,STRANDED,TYPE E,WHT	EA	A/R		23
5230	1000643-403	C	CORE,FERRITE,BEAD,1/2 CMD5005	EA	9.000	ARC\1000643	24
5240	1011205-101	-	SHIM	EA	4.000	ARC-B\1011205	25
5250	66079		WIRE,TFE,22 AWG,STRANDED,TYPE E,WHT/RED	IN	A/R		26
5260	69319		CABLE TIES, 0.6 MAX BUNDLE DIA,2.8 L	EA	4.000	PNT\PLT.65MC	27

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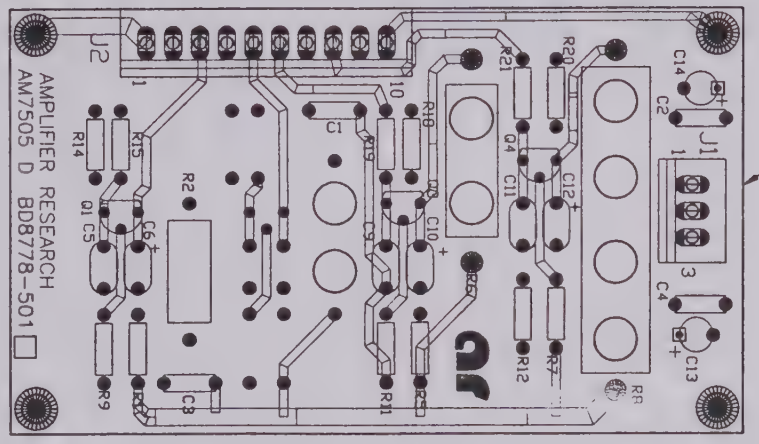
ECN	DATE	REV
XXXXX	210CT99	1
REL	6DEC99	–
105388	2MAY00	A

REL NO. 1104-10



1

FOR BOM, SEE 1010748-501

ITEM	QTY. REQD.	PART NO.	DESCRIPTION	MARK	FIN	MATL
		PARTS LIST				

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UP TO 6	±.02	±.005
ABOVE 6 TO 24	±.03	±.010
ABOVE 24	±.06	±.015

ANGULAR DIMENSIONS 1/2°

1S1G4
USED ON MODEL

DRAWN J.H.REED DATE 21 OCT 99
CHKD J.H.REED DATE 16 DEC 99
MECH J.MAGINN DATE 02 DEC 99
ELEC J.ALDERFER DATE 16 DEC 99

AMPLIFIER RESEARCH

PWB,ASSY
BIAS CONTROL BD.

DWG. NO. 1010748

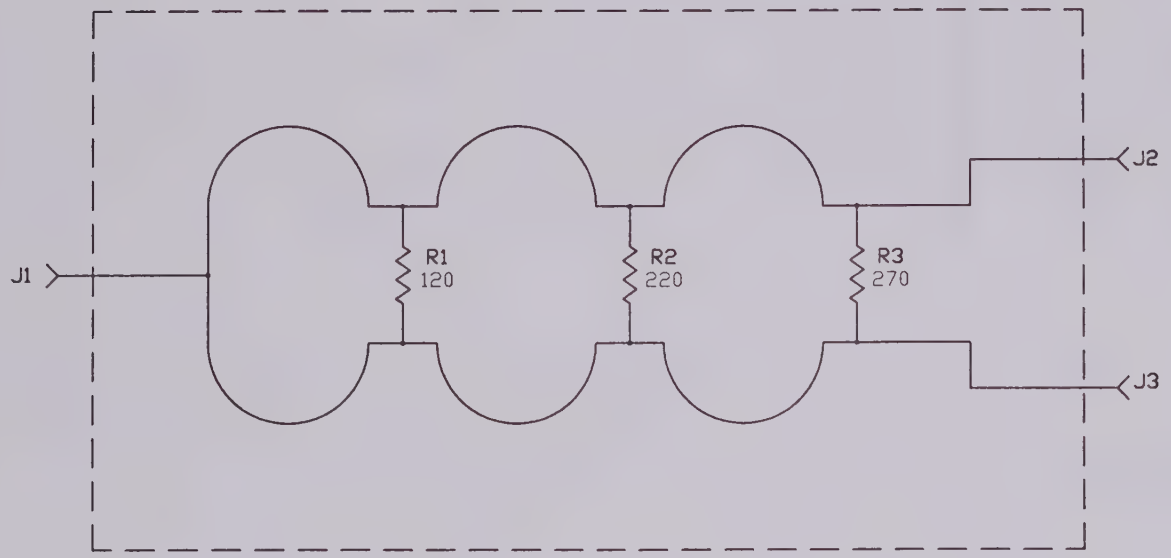
SCALE NONE | SHEET 1 OF 1 | REV. A

BILL NO: 1010748-501 REV: B U/M: EA DRAWING NO: ARC-C\1010748
PWB ASSY,BIAS CTRL,1W S MODULE

SEQ	PART NUMBER	REV	D E S C R I P T I O N	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
0010	1010748	A	ASSY DWG,BIAS CTRL,1W S MODULE	EA	REF	ARC-C\1010748	
0020	1010749	B	SCHEM DIAG,BIAS CTRL	EA	REF	ARC-C\1010749	
0400	27236		CAPR,FXD,DIP SPACED CER,.1UF,50VDC	EA	4.000	AVX\MD015C104MAA	C1 ,C2 C3 ,C4
0410	27179		CAPR,CER,1000pF,1000V,10%,CHAR Z5F	EA	3.000	NIC\NCD102K1KVY5F	C5 ,C9 C11
0420	27051		CAPR,TANT,33UF,35VDC,EPOXY	EA	3.000	AVX\TAP336K035HSB	C6 ,C10 C12
0430	27055		CAPR,TANT,6.8UF,50V	EA	2.000	MAL\TDC685K050NLF	C13 ,C14
1500	41082		CONN,STR,3 PIN	EA	1.000	PNT\MLSS156-3	J1
1510	41084		CONN,LOCKING HEADER,STR,10 PIN,SQR POSTS	EA	1.000	PNT\MLSS156-10-L	J2
2500	2N3906		XSTR,SWNG,PNP,40V,0.2A,1W	EA	3.000	ARE\2N3906	Q1 ,Q3 Q4
2700	55612-1501J		RES,FXD,METAL FILM,1.5K,5%,1/4-1/2W	EA	1.000	TRW\GP55-1501+/-5%	R1
2730	55514-1200J		RES,FXD,CARBON COMP,120,5%,1W	EA	1.000	A-B\GB1215	R2
2740	55612-2201J		RES,FXD,METAL FILM,2.2K,5%,1/4-1/2W	EA	2.000	TRW\GP55-2201+/-5%	R5 ,R7
2750	55515-33R0J		RES,FXD,CARBON COMP,33,5%,2W	EA	1.000	A-B\HB3305	R6
2760	55724-18R0J		RES,FXD,WW,18,5%,11W	EA	1.000	OHM\90J18R	R8
2770	55612-1101J		RES,FXD,METAL FILM,1.1K,5%,1/4-1/2W	EA	1.000	TRW\GP55-1101+/-5%	R9
2780	55612-3001F		RES,FXD,PRECISION,3K,1%,1/4W,CHAR.D	EA	2.000	IRC\RN55D3001F	R11 ,R12
2800	55612-3901J		RES,FXD,METAL FILM,3.9K,5%,1/4-1/2W	EA	2.000	TRW\GP55-3901+/-5%	R14 ,R15
2810	55612-2701J		RES,FXD,METAL FILM,2.7K,5%,1/4-1/2W	EA	2.000	TRW\GP55-2701+/-5%	R18 ,R20
2820	55612-4701J		RES,FXD,METAL FILM,4.7K,5%,1/4-1/2W	EA	2.000	TRW\GP55-4701+/-5%	R19 ,R21
5000	1007505-101	D	PWB,BIAS CTRL,1 WATT AMP	EA	1.000	ARC-B\1007505	1

REL. 1154-02

ECN	DATE	REV
XXXX	17MAR97	1
REL	02MAY97	–



QTY. REQD.	ITEM	PART NO.	DESCRIPTION	MARK	FIN	MATL
		PARTS LIST				

UNLESS OTHERWISE SPECIFIED
DO NOT SCALE DRAWING
DIMENSIONS ARE IN INCHES AND INCLUDE PLATING THICKNESS
ALL THREADS ARE UNIFIED NATIONAL SERIES, CLASS 2
REMOVE ALL BURRS AND SHARP EDGES

BASIC DIMENSIONS	2 PLACE DECIMALS	3 PLACE DECIMALS
UP TO 6	±.02	±.005
ABOVE 6 TO 24	±.03	±.010
ABOVE 24	±.06	±.015

ANGULAR DIMENSIONS 1/2°

50S1G4
USED ON MODEL

DRAWN J.H.REED
DATE 17 MAR 97
CHKD J.H.REED
DATE 02 MAY 97
MECH
DATE
ELEC
DATE

AMPLIFIER RESEARCH

SCHEMATIC
2 WAY SPLITTER

DWG. NO. 1008632

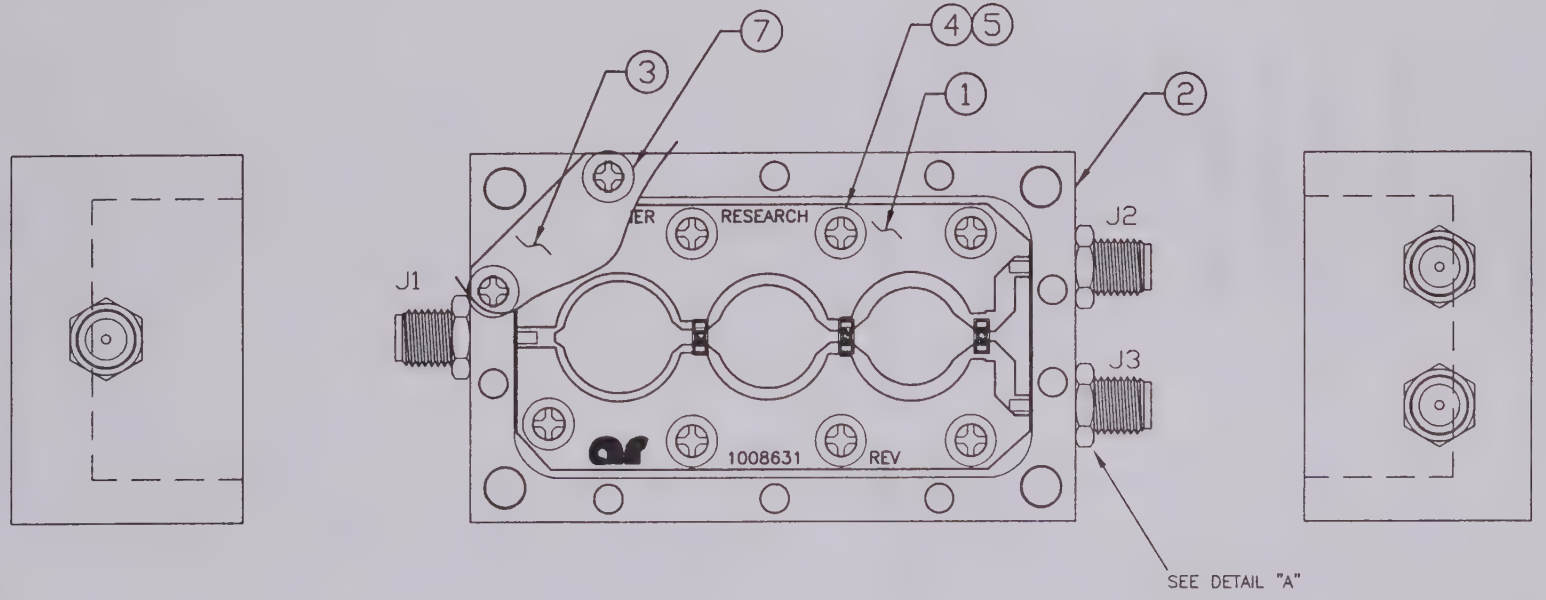
SCALE NONE | SHEET 1 OF 1 | REV. —

BILL NO: 1008627-501 REV: A U/M: EA DRAWING NO: ARC-D\1008627
RF ASSY,FINAL

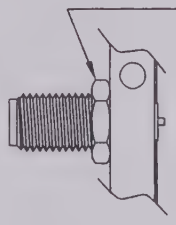
SEQ	PART NUMBER	REV	D E S C R I P T I O N	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
0010	1008620	A	SCHEM DIAG,50S1G4	EA	REF	ARC-D\1008620	
0020	1008627	-	ASSY DWG,RF ASSY,FINAL	EA	REF	ARC-D\1008627	
0100	1008615-501	J	PWB ASSY,QUAD AMP	EA	8.000	ARC-D\1008615	A12 ,A13 A14 ,A15 A16 ,A17 A18 ,A19
3100	57062		SW,TEMP SENSING,N.C.,OPEN AT 70C	EA	2.000	AIR\67L070	S3 ,S4
5000	1008609-101	A	HEATSINK	EA	1.000	ARC-D\1008609	1
5020	11025		SCREW,MACH,PAN HD,CROSS-REC,S/S,6-32 X 1.50	EA	24.000	\MS51957-36	3
5030	12048		WASH,LOCK,SPLIT,S/S,#6	EA	26.000	\MS35338-136	4
5050	11016		SCREW,MACH,PAN HD,CROSS-REC,S/S,6-32 X .38	EA	2.000	\MS51957-28	6

ECN	DATE	REV
XXXX	14MAR97	1
REL	20NOV97	–
10976	25JUN01	A

REL.1154-02



DETAIL "A"



TRIM TEFLON OF PARTS J1,J2 AND J3 FLUSH WITH CONNECTOR BODY. CUT CENTER PIN TO 0.075"(IN) INSTALL CONNECTOR FLUSH WITH INNER HOUSING WALL. TIGHTEN LOCKING NUT "A" SECURELY. (DO NOT USE SUPPLIED WASHER)

FOR BOM SEE 1008630-501

ITEM	QTY. REQD.	PART NO.	DESCRIPTION	MARK	FIN	MATL
		PARTS LIST				

UNLESS OTHERWISE SPECIFIED
DO NOT SCALE DRAWING
DIMENSIONS ARE IN INCHES AND INCLUDE PLATING THICKNESS
ALL THREADS ARE UNIFIED NATIONAL SERIES, CLASS 2
REMOVE ALL BURRS AND SHARP EDGES

BASIC DIMENSIONS	2 PLACE DECIMALS	3 PLACE DECIMALS
UP TO 6	±.02	±.005
ABOVE 6 TO 24	±.03	±.010
ABOVE 24	±.06	±.015
ANGULAR DIMENSIONS 1/2°		

50S1G4
USED ON MODEL

DRAWN J.H.REED DATE 14 MAR 97
CHKD J.H.REED DATE 20 NOV 97
MECH J.MAGINN DATE 21 NOV 97
ELEC F.SCHIRK DATE 20 NOV 97

AMPLIFIER RESEARCH

ASSEMBLY
2 WAY SPLITTER

DWG. NO. 1008630

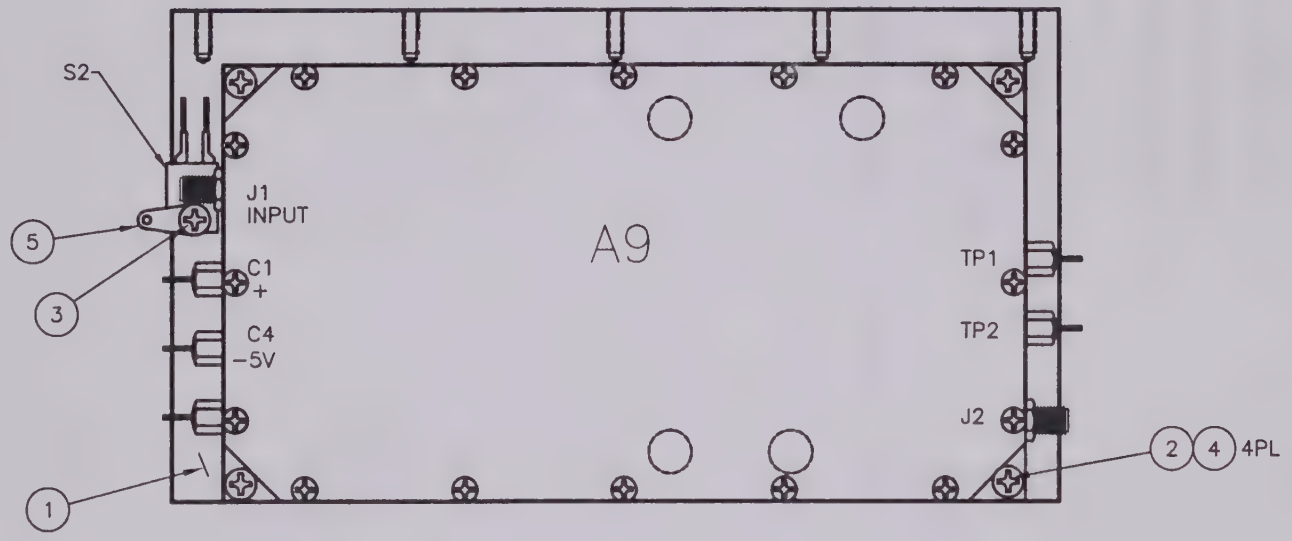
SCALE NONE | SHEET 1 OF 1 | REV. A

BILL NO: 1008630-501 REV: A U/M: EA DRAWING NO: ARC-B\1008630
PWB ASSY,2 WAY SPLITTER

SEQ	PART NUMBER	REV	D E S C R I P T I O N	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
0010	1008632	-	SCHEM DIAG,2 WAY SPLITTER	EA	REF	ARC-B\1008632	
0020	1008630	A	ASSY DWG,2 WAY SPLITTER	EA	REF	ARC-B\1008630	
1500	41243		CONN,COAX,BULKHD JACK,SMA,(F)	EA	3.000	DTA\1321000K82165	J1 ,J2 J3
2700	55647-1200J		RES,FXD,CHIP,120,5%,1/8W	EA	1.000	D-K\P120-ECT-ND	R1
2710	55647-2200J		RES,FXD,CHIP,220,5%,1/8W	EA	1.000	D-K\P220-ECT-ND	R2
2720	55647-2700J		RES,FXD,CHIP,270,5%,1/8W	EA	1.000	D-K\P270-ECT-ND	R3
5000	1008631-101	-	PWB,2 WAY SPLITTER	EA	1.000	ARC-B\1008631	1
5010	1008635-101	-	HSG,2 WAY SPLITTER	EA	1.000	ARC-B\1008635	2
5020	1008636-101	A	COVER,2 WAY SPLITTER	EA	1.000	ARC-B\1008636	3
5030	11202		SEM,MACH SCREW,PHP W/SPLIT LK WASH,S.S.,4-40x.25	EA	8.000		4
5040	12010		WASH,FLAT,S/S,#4,.250 OD X .125 ID X .022 THK	EA	8.000	\MS15795-803	5
5060	11173		SCREW,MACH,FLT,HD,100 DEG,CROSS-REC,S/S,4-40X.187	EA	10.000	\MS24693-C1	7

REL #2022-01

ECN	DATE	REV
REL	16AUG99	–
10296	6DEC99	A



FOR BOM SEE 1010571-501

ITEM	QTY. REQD.	PART NO.	DESCRIPTION	MARK	FIN	MATL
		PARTS LIST				

UNLESS OTHERWISE SPECIFIED
DO NOT SCALE DRAWING
DIMENSIONS ARE IN INCHES AND INCLUDE PLATING THICKNESS
ALL THREADS ARE UNIFIED NATIONAL SERIES, CLASS 2
REMOVE ALL BURRS AND SHARP EDGES

BASIC DIMENSIONS	2 PLACE DECIMALS	3 PLACE DECIMALS
UP TO 6	±.02	±.005
ABOVE 6 TO 24	±.03	±.010
ABOVE 24	±.06	±.015

ANGULAR DIMENSIONS 1/2°

50S1G4A
USED ON MODEL

DRAWN G.JACKSON DATE 16 JUN 99
CHKD G.JACKSON DATE 16 JUN 99
MECH J.MAGINN DATE 8/18/99
ELEC F.SCHIRK DATE 17 AUG 99

AMPLIFIER RESEARCH

AUX RF LOW LEVEL ASSY

DWG. NO. 1010571

SCALE 1/1 SHEET 1 OF 1 REV. A

BILL NO: 1010571-501 REV: B U/M: EA DRAWING NO: ARC-B\1010571
AUX RF LOW LEVEL ASSY

SEQ	PART NUMBER	REV	D E S C R I P T I O N	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
0010	1010571	A	ASSY DWG,AUX RF LOW LEVEL	EA	REF	ARC-B\1010571	
0100	1009161-501	L	PWB ASSY,QUAD AMP,100S1G4	EA	1.000	ARC-D\1009161	A9
3100	57062		SW,TEMP SENSING,N.C.,OPEN AT 70C	EA	1.000	AIR\67L070	S2
5000	1009481-101	B	HEATSINK	EA	1.000	ARC-C\1009481	1
5010	11025		SCREW,MACH,PAN HD,CROSS-REC,S/S,6-32 X 1.50	EA	4.000	\MS51957-36	2
5020	11016		SCREW,MACH,PAN HD,CROSS-REC,S/S,6-32 X .38	EA	1.000	\MS51957-28	3
5030	12048		WASH,LOCK,SPLIT,S/S,#6	EA	5.000	\MS35338-136	4
5040	69100		LUG,SHAKEPROOF,BENT,41/64 L,#6 STUD,DUAL HOLE	EA	1.000	HHS\1416-6	5

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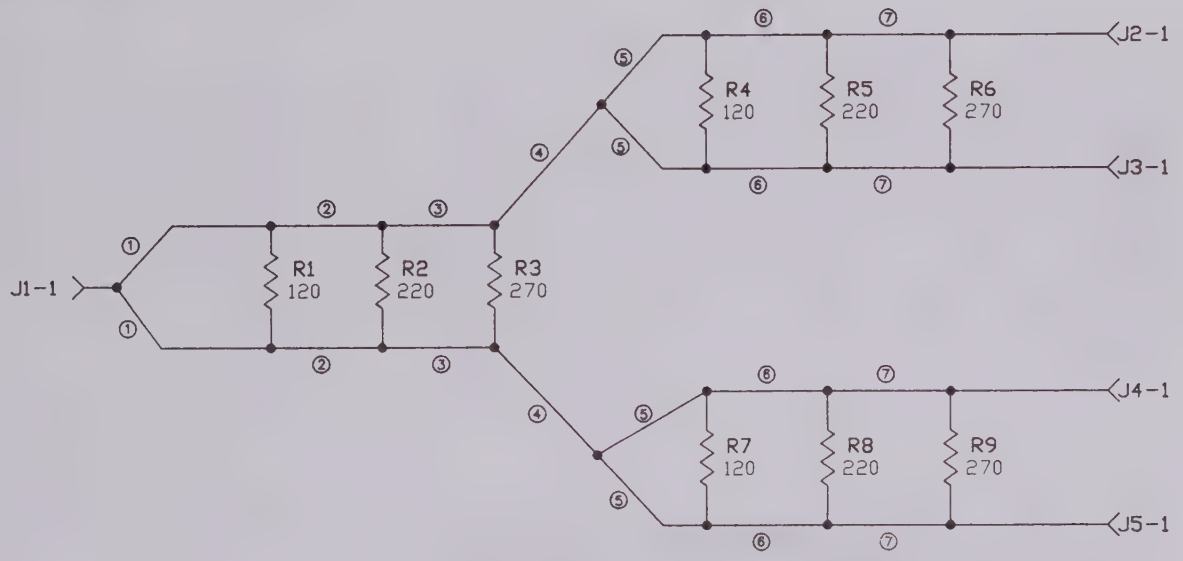
REL. NO. 1196-03

ECN	DATE	REV
XXXX	13NOV98	1
REL	28MAY99	–



QTY. REQD.	ITEM	PART NO.	DESCRIPTION	MARK	FIN	MATL
		PARTS LIST				

UNLESS OTHERWISE SPECIFIED
DO NOT SCALE DRAWING
DIMENSIONS ARE IN INCHES AND INCLUDE PLATING THICKNESS
ALL THREADS ARE UNIFIED NATIONAL SERIES, CLASS 2
REMOVE ALL BURRS AND SHARP EDGES

BASIC DIMENSIONS	2 PLACE DECIMALS	3 PLACE DECIMALS
UP TO 6	±.02	±.005
ABOVE 6 TO 24	±.03	±.010
ABOVE 24	±.06	±.015

ANGULAR DIMENSIONS 1/2°

100S1G4
USED ON MODEL

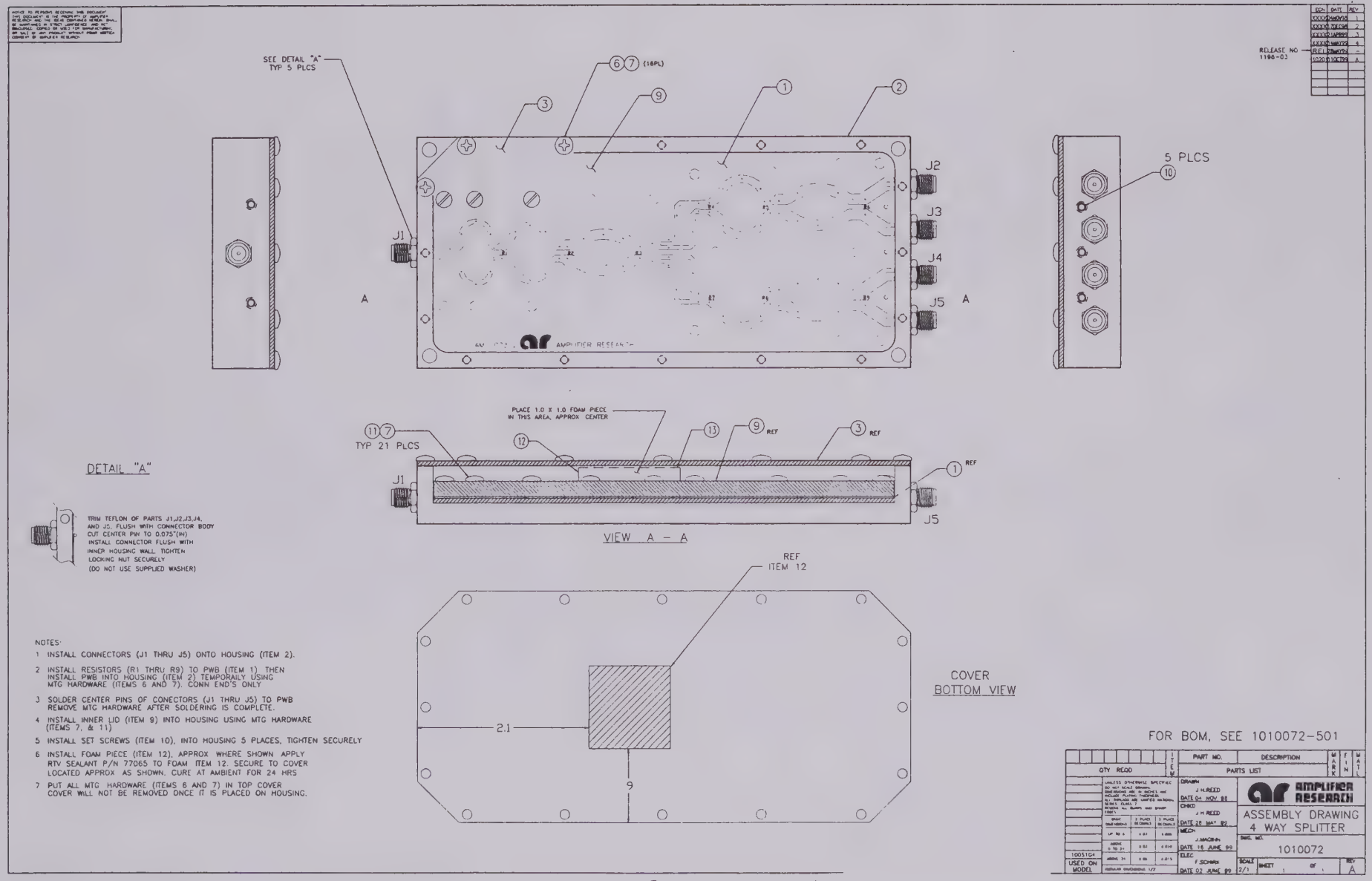
DRAWN J.H.REED DATE 10 NOV 98
CHKD J.H.REED DATE 28 MAY 99
MECH J. Major DATE 6/16/99
ELEC F. Schick DATE 2 Jun 99

AMPLIFIER RESEARCH

SCHEMATIC
4 WAY SPLITTER #3

DWG. NO. 1010074

SCALE NONE | SHEET 1 OF 1 | REV. —



ECN	DATE	REV
XXXXX	08NOV02	1
XXXXX	17DEC02	2
XXXXX	14APR03	3
XXXXX	16MAY03	4
REL	23MAY03	-
10201	10OCT03	A

RELEASE NO 1196-03

NOTES:

1 INSTALL CONNECTORS (J1 THRU J5) ONTO HOUSING (ITEM 2).

2 INSTALL RESISTORS (R1 THRU R9) TO PWB (ITEM 1). THEN INSTALL PWB INTO HOUSING (ITEM 2) TEMPORAILY USING MTG HARDWARE (ITEMS 6 AND 7). CONN END'S ONLY

3 SOLDER CENTER PINS OF CONECTORS (J1 THRU J5) TO PWB REMOVE MTG HARDWARE AFTER SOLDERING IS COMPLETE.

4 INSTALL INNER LID (ITEM 9) INTO HOUSING USING MTG HARDWARE (ITEMS 7, & 11)

5 INSTALL SET SCREWS (ITEM 10), INTO HOUSING 5 PLACES, TIGHTEN SECURELY

6 INSTALL FOAM PIECE (ITEM 12), APPROX WHERE SHOWN APPLY RTV SEALANT P/N 77065 TO FOAM ITEM 12. SECURE TO COVER LOCATED APPROX AS SHOWN. CURE AT AMBIENT FOR 24 HRS

7 PUT ALL MTG HARDWARE (ITEMS 6 AND 7) IN TOP COVER COVER WILL NOT BE REMOVED ONCE IT IS PLACED ON HOUSING.

FOR BOM, SEE 1010072-501

ITEM	QTY REQD	PART NO.	DESCRIPTION	MARK	FIN	MATL
			PARTS LIST			

DRAWN	J H REED
DATE	04 NOV 02
CHKD	J M REED
DATE	28 MAY 03
MECH	J MAGINN
DATE	16 JUNE 99
ELEC	F SCHIRR
DATE	02 JUNE 99

AMPLIFIER RESEARCH

ASSEMBLY DRAWING
4 WAY SPLITTER

DWG. NO. 1010072

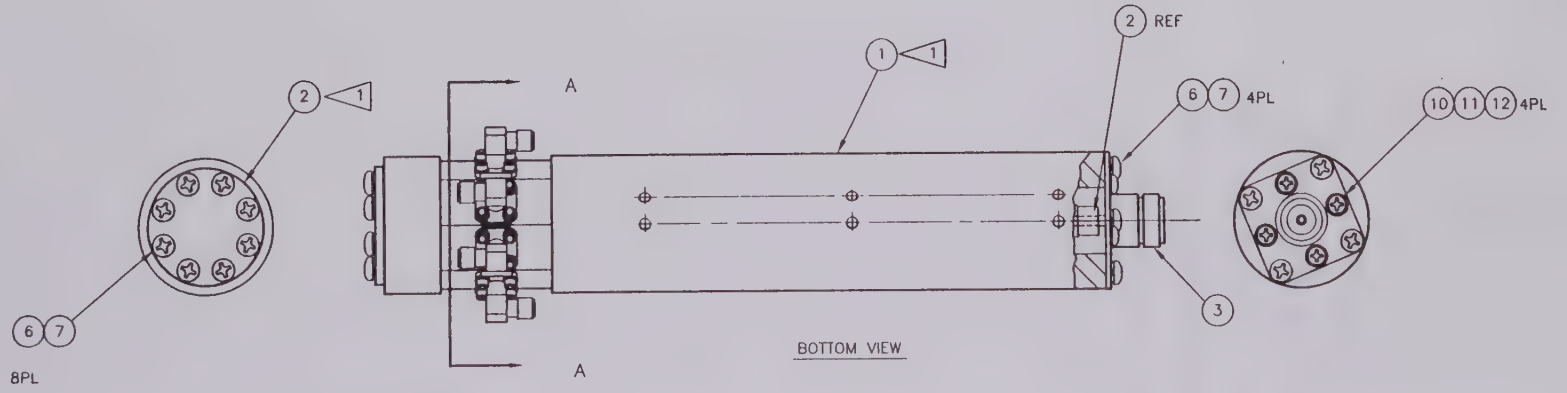
SCALE 2/1 SHEET 1 OF 1 REV A

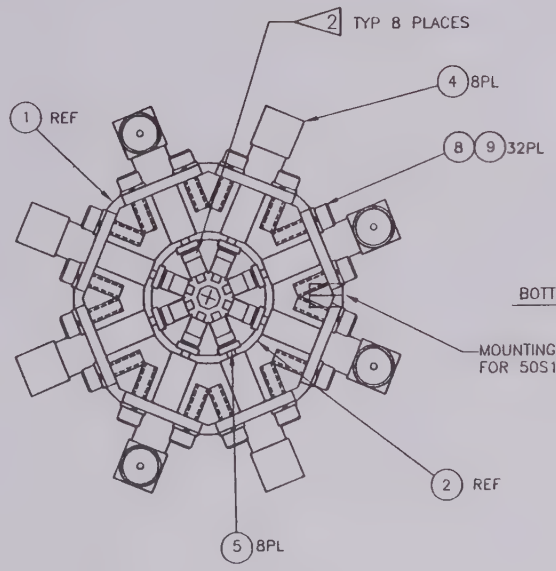
10051G1
USED ON MODEL

BILL NO: 1010072-501 REV: A U/M: EA DRAWING NO: ARC-D\1010072
PWB ASSY,4 WAY SPLITTER #3

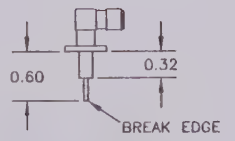
SEQ	PART NUMBER	REV	D E S C R I P T I O N	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
0010	1010072	A	ASSY DWG,4 WAY SPLITTER #3	EA	REF	ARC-D\1010072	
0020	1010074	-	SCHEM DIAG,4 WAY SPLITTER #3	EA	REF	ARC-B\1010074	
1500	41243		CONN,COAX,BULKHD JACK,SMA,(F)	EA	5.000	DTA\1321000K82165	J1 ,J2 J3 ,J4 J5
2700	55651-1200J		RES,FXD,CHIP,120,5%,1/4W	EA	3.000	D-K\P120VCT-ND	R1 ,R4 R7
2710	55651-2200J		RES,FXD,CHIP,220,5%,1/4W	EA	3.000	D-K\P220VCT-ND	R2 ,R5 R8
2720	55651-2700J		RES,FXD,CHIP,270,5%,1/4W	EA	3.000	D-K\P270VCT-ND	R3 ,R6 R9
5000	1010073-101	A	PWB,4 WAY SPLITTER #3	EA	1.000	ARC-B\1010073	1
5010	1010075-101	-	HSG,4 WAY SPLITTER #3	EA	1.000	ARC-B\1010075	2
5020	1008122-101	-	COVER,4 WAY SPLITTER	EA	1.000	ARC-B\1008122	3
5040	11010		SCREW,MACH,PAN HD,CROSS-REC,S/S,4-40 X .25	EA	16.000	\MS51957-13	6
5050	12047		WASH,LOCK,SPLIT,S/S,#4	EA	37.000	\MS35338-135	7
5070	1010076-101	-	LID,INNER,4 WAY SPLITTER #3	EA	1.000	ARC-B\1010076	9
5080	11183		SET SCREW,HEX SOCKET,CUP PT,S/S,6-32 X .19	EA	5.000		10
5090	11011		SCREW,MACH,PAN HD,CROSS-REC,S/S,4-40 X .38	EA	21.000	\MS51957-15	11
5100	69332		FOAM,CONDUCTIVE	IN	A/R	MMM\2802	12
5110	77065		SEALANT,RTV,FLUOROSILE	OZ	A/R	G-E\730 RTV	13

ECN		REV
–	16[illegible]	0
–	18SEP95	1
–	27SEP95	2
REL	25JAN96	–
REL	21MAY96	A
9177	27OCT97	B
10426	13MAR00	C

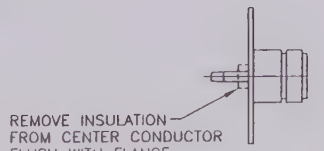




SECTION A–A
SCALE 2=1



MODIFICATION OF P/N 4



MODIFICATION OF P/N 3

NOTES:

1. THOROUGHLY DE–GREASE ITEMS 1 & 2 BEFORE ASSEMBLY.
2. PRESS ITEM 5 INTO ITEM 2, 8 PLACES, USING ARBOR PRESS WITH SUITABLE TOOL. FLANGE OF ITEM 5 SHOULD BOTTOM IN .140 DIA C'BORE OF ITEM 2. DO NOT DEFORM PIN RECEPTACLE SHELL OR INTERNAL FINGERS.

SEE BOM 1007409–501

ITEM QTY. REQD.	PART NO.	DESCRIPTION	MARK	FIN	MATL
	PARTS LIST				

UNLESS OTHERWISE SPECIFIED
DO NOT SCALE DRAWING
DIMENSIONS ARE IN INCHES AND INCLUDE PLATING THICKNESS
ALL THREADS ARE UNIFIED NATIONAL SERIES CLASS 2
REMOVE ALL BURRS AND SHARP EDGES

BASIC DIMENSIONS	2 PLACE DECIMALS	3 PLACE DECIMALS
UP TO 6	±.02	±.005
ABOVE 6 TO 24	±.03	±.010
ABOVE 24	±.06	±.015

ANGULAR DIMENSIONS 1/2°

DRAWN	C BICKELMAN DATE 14 AUG 95
CHKD	C BICKELMAN DATE 17 AUG 95
MECH	J. MAGINN DATE 25 JAN 96
ELEC	J. MAGGHAN DATE 25 JAN 96

50S1G4
10S1G4
USED ON MODEL

AMPLIFIER RESEARCH

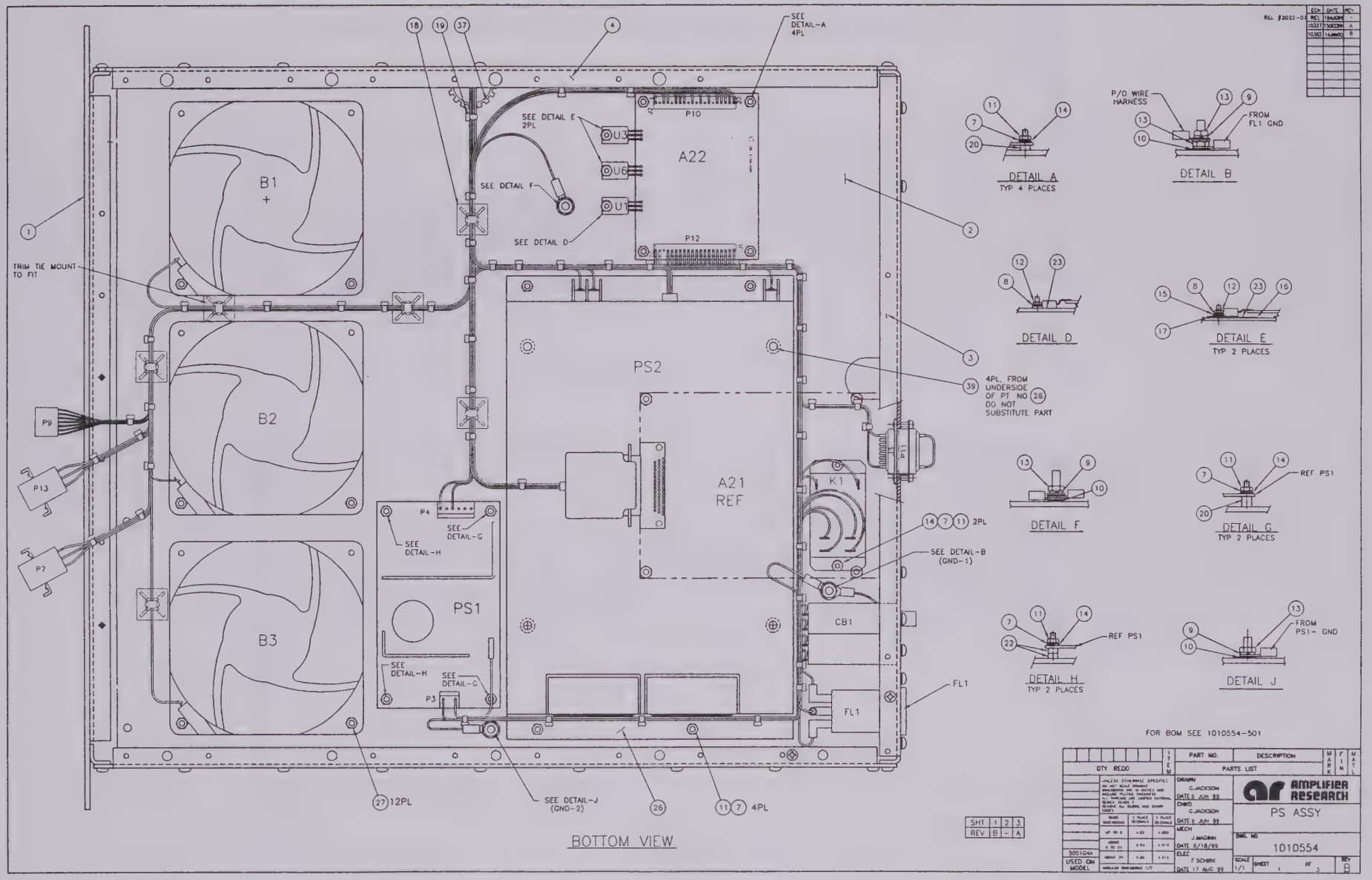
COMBINER ASSY, 8 WAY

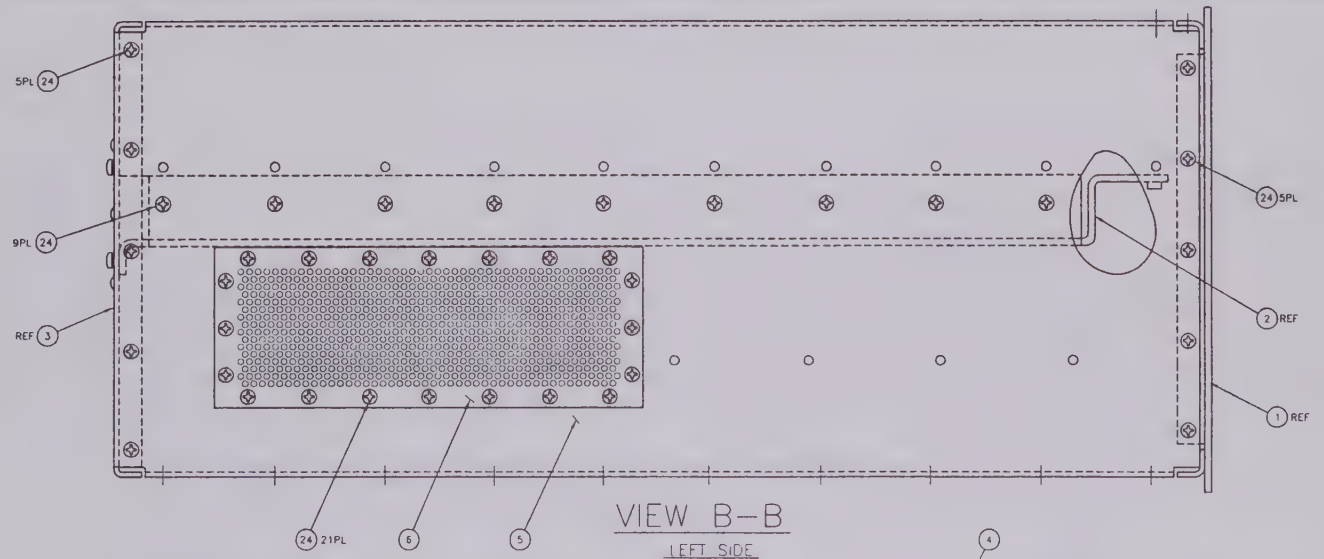
DWG. NO. 1007409

SCALE 1/1 SHEET 1 OF 1 REV. C

BILL NO: 1004709-501 REV: - U/M: EA DRAWING NO:
CABLE KIT

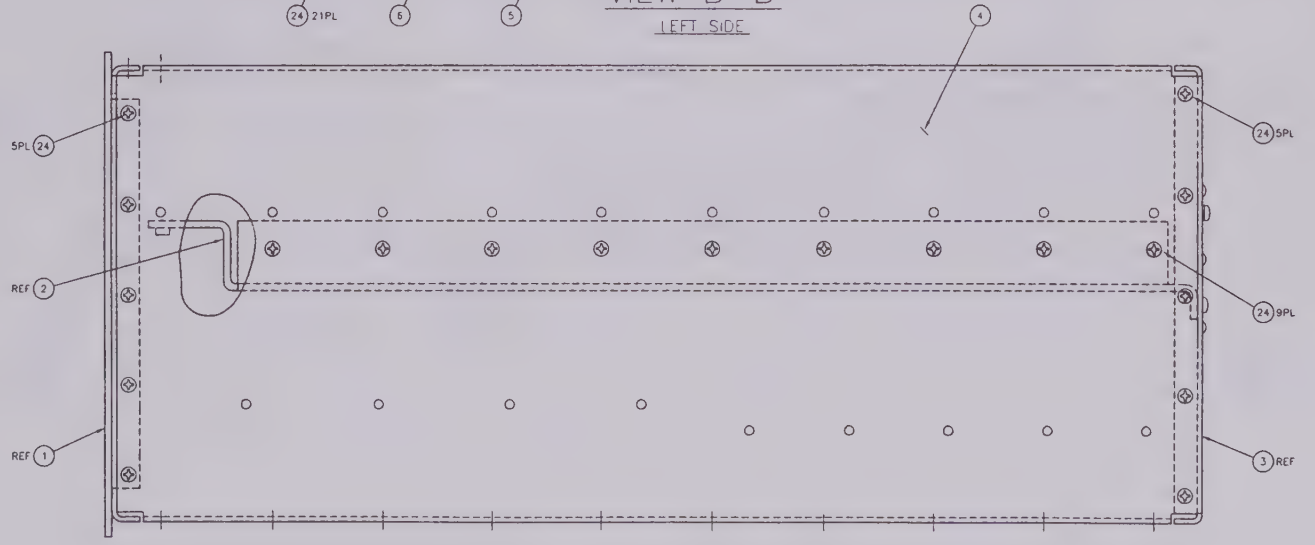
SEQ	PART NUMBER	REV	D E S C R I P T I O N	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
4200	20023	-	CABLE ASSY,COAX,RG-188A/U,BNC,BNC,8.5"	EA	1.000	ARC-A\1002494	W1
4210	20237	-	CABLE ASSY,COAX,RG-188A/U,BNC,BNC,41.0"	EA	1.000	ARC-A\1002494	W2
4220	20238	-	CABLE ASSY,COAX,RG-142B/U,BNC,BNC,16.0"	EA	1.000	ARC-A\1002494	W3
4230	20033	-	CABLE ASSY,COAX,RG-142B/U,BNC,BNC,32.0"	EA	1.000	ARC-A\1002494	W4
4240	20206	-	CABLE ASSY,COAX,RG-225/U,C,C,10.0"	EA	1.000	ARC-A\1002494	W5
4250	20239	-	CABLE ASSY,COAX,RG-188A/U,SMA,SMA,11.0"	EA	1.000	ARC-A\1002494	W6
4260	20027	-	CABLE ASSY,COAX,RG-188A/U,BNC,BNC,35.0	EA	1.000	ARC-A\1002494	W7
4270	20029	-	CABLE ASSY,COAX,RG-142B/U,BNC,N,45.0	EA	1.000	ARC-A\1002494	W8


B1
+
B2
B3
A22
P10
P12
U3
U6
U1
SEE DETAIL E
2PL
SEE DETAIL F
SEE DETAIL D
SEE DETAIL-A
4PL
PS2
A21
REF
K1
P11
PS1
P4
P3
SEE DETAIL-G
SEE DETAIL-H
CB1
FL1
P9
P13
P7
TRIM TIE MOUNT
TO FIT
4PL, FROM
UNDERSIDE
OF PT NO (26)
DO NOT
SUBSTITUTE PART
SEE DETAIL-B
(GND-1)
(14)(7)(11) 2PL
(27) 12PL
SEE DETAIL-J
(GND-2)
(26)
(11)(7) 4PL
DETAIL A
TYP 4 PLACES
P/O WIRE
HARNESS
FROM
FL1 GND
DETAIL B
DETAIL D
DETAIL E
TYP 2 PLACES
DETAIL F
REF PS1
DETAIL G
TYP 2 PLACES
DETAIL H
TYP 2 PLACES
FROM
PS1- GND
DETAIL J
BOTTOM VIEW
FOR BOM SEE 1010554-501
PART NO.
DESCRIPTION
PARTS LIST
QTY REQD
ITEM
MARK
FIN
MATL
DRAWN
G.JACKSON
DATE 8 JUN 89
CHKD
G.JACKSON
DATE 8 JUN 89
MECH
J.MACOMB
DATE 8/18/89
ELEC
F SCHIRK
DATE 17 AUG 89
AMPLIFIER RESEARCH
PS ASSY
DWG NO
1010554
SCALE
1/1
SHEET
1
OF
3
REV
B
5051GAA
USED ON
MODEL
SHT 1 2 3
REV B - A
ECN
DATE
REV
REL #2022-01
16AUG89
16AUG89
14JAN90



VIEW B–B

LEFT SIDE



VIEW A–A

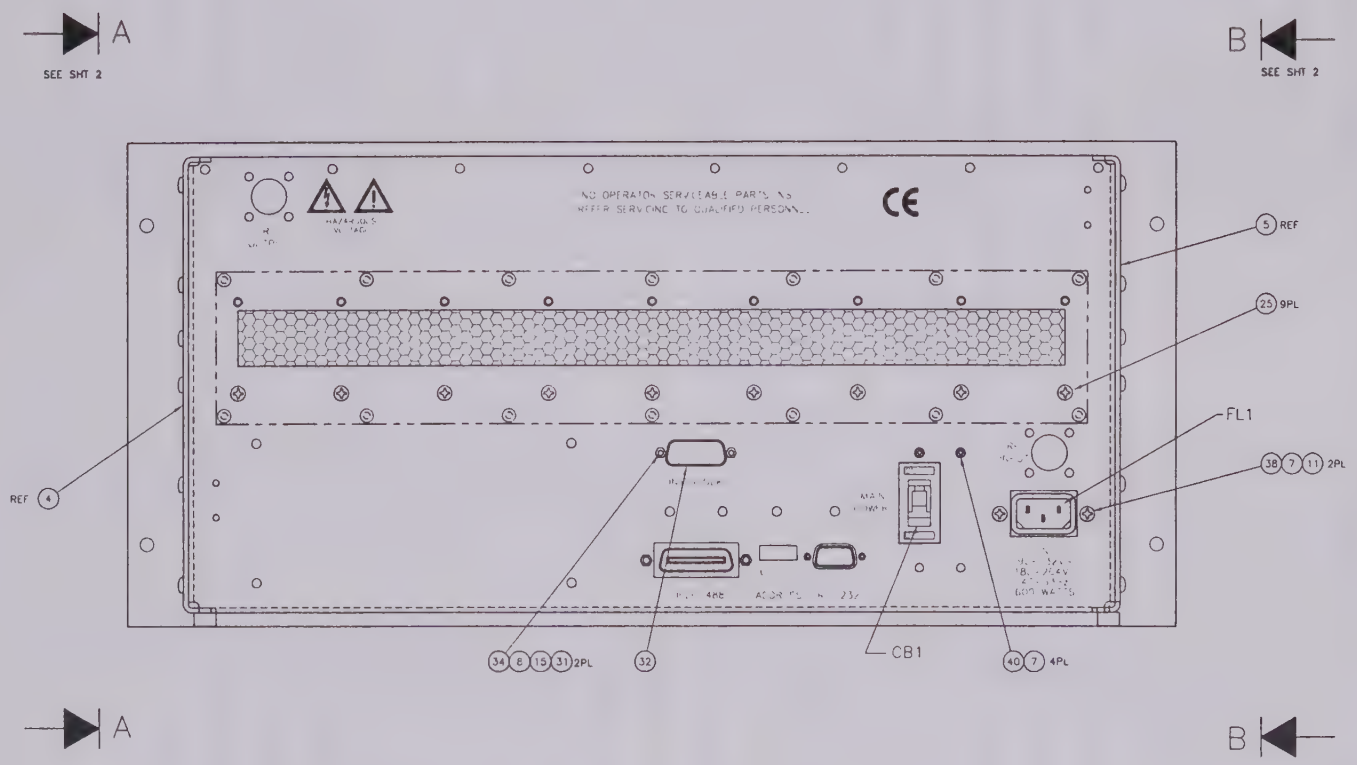
RIGHT SIDE

ECN	DATE	BY
REL	MM/DD	—

REL #2022-01

DWG. NO. 1010554

SCALE 1/1 SHEET 2 OF 3 REV —



REL #2022-01	ECN	DATE	REV
	REL	3AUG09	-
	10327	15DEC09	A

DWG NO. 1010554

SCALE 1/1 SHEET 3 OF 3 REV A

BILL NO: 1010554-501 REV: B U/M: EA DRAWING NO: ARC-D\1010554
PS ASSY

SEQ	PART NUMBER	REV	D E S C R I P T I O N	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
0010	1010552	D	SCHEM DIAG,50S1G4A	EA	REF	ARC-D\1010552	
0020	1010554	B	ASSY DWG,PS	EA	REF	ARC-D\1010554	
0100	1009512-501	-	REG CTRL BD ASSY	EA	1.000	ARC-C\1009512	A22
0200	37020	-	FAN,AXIAL,24 VDC,106 CFM,	EA	3.000	PAM\4124KX	B1 ,B2 B3
0205	35086	-	CKT BRKR,2 POLE,10A	EA	1.000	AIR\IEL11162F1001V	CB1
1400	35020		FILT,LINE,15 AMP	EA	1.000	SPR\15JX5451A	FL1
1700	43046		RELAY,MED PWR,12VDC COIL,30A CONTACT RATING	EA	1.000	DIGIKEY\PB298-ND	K1
2400	25066		PS,SWNG,85-264VAC,TRIPLE OUT,+5V,+12V,-12V,25W	EA	1.000	CPI\NFS25-7608	PS1
2410	25090		PS,SWNG,+15V,+24V,-24V	EA	1.000	AST\MP8-3N-4QQ-00	PS2
3720	60046		INTEGRATED CKT,3 TERM,POS REG.	EA	1.000	MOT\MC7815CT	U1
3740	60048		INTEGRATED CKT,3 TERM,NEG REG.	EA	1.000	MOT\MC7915CT	U6
3750	60066		IC,3 TERM,NEG REG	EA	1.000	MOT\MC7905CT	U3
5000	1010553-501	B	CTRL PNL ASSY	EA	1.000	ARC-D\1010553	1
5010	1010558-301	B	CHASSIS	EA	1.000	ARC-D\1010558	2
5020	1010562-301	A	PNL,REAR	EA	1.000	ARC-D\1010562	3
5030	1008607-101	B	PANEL,RT SIDE	EA	1.000	ARC-D\1008607	4
5040	1010559-101	-	PNL,LEFT SIDE	EA	1.000	ARC-D\1010559	5
5050	1010560-101	A	SCREEN	EA	1.000	ARC-B\1010560	6
5060	12048		WASH,LOCK,SPLIT,S/S,#6	EA	14.000	\MS35338-136	7
5070	12047		WASH,LOCK,SPLIT,S/S,#4	EA	7.000	\MS35338-135	8
5080	12050		WASH,LOCK,SPLIT,S/S,#10	EA	2.000	\MS35338-138	9
5090	12059		WASH,LOCK,EXT TOOTH,S/S,#10	EA	2.000	\MS35335-60	10
5100	13004		NUT,HEX,S/S,6-32,.250AF	EA	14.000		11
5110	13003		NUT,HEX,S/S,4-40,.187AF	EA	4.000		12

BILL NO: 1010554-501 REV: B U/M: EA DRAWING NO: ARC-D\1010554
PS ASSY

SEQ	PART NUMBER	REV	D E S C R I P T I O N	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
5120	13007		NUT,HEX,S/S,10-32,.343AF	EA	3.000		13
5130	12011		WASH,FLAT,S/S,#6,.312 OD X .156 ID X .035 THK	EA	8.000	\MS15795-805	14
5140	12010		WASH,FLAT,S/S,#4,.250 OD X .125 ID X .022 THK	EA	6.000	\MS15795-803	15
5150	69090		INSUL,HD ANODIZED,TYPE TO-220,.950 L,.500 W	EA	2.000	THM\4777A	16
5160	12037		WASH,SHLDR,N,.232 OD X .115 ID X .047 SHLD.THK.	EA	2.000	REL\NY-04-040	17
5170	69238	-	BASE,MTG,CABLE TIE,ADH BACK,3/4 X 3/4	EA	A/R	TAB\TC-344A	18
5180	69161		CABLE TIES,1 3/8 MAX BUNDLE DIA,5 5/8 L	EA	A/R	PNT\PLT1.5MP	19
5200	14007		SPACER,HEX,NON-THD,.250 HEX X .250 LG X 6 ID	EA	6.000	HHS\2300	20
5220	12044		WASH,FLAT,NYLON,.312 OD X .140 ID X .125 THK	EA	23.000	MIP\16FW006125	22
5230	77064		COMPOUND,THERMAL JOINT,TYPE 120	EA	A/R	WAK\120-S	23
5240	11137		SCREW,MACH,PAN HD,CROSS-REC,S/ZN,6-32X.31,TYPE SW	EA	38.000		24
5250	11018		SCREW,MACH,PAN HD,CROSS-REC,ZN,6-32 X .38,TYPE SW	EA	9.000		25
5260	1010561-101	-	BASE PL	EA	1.000	ARC-D\1010561	26
5270	13024		NUT,SELF-LOCK,HEX,REG HT,NYLON INSERT,S/S,4-40	EA	12.000	\MS21044C04	27
5300	69262		SCREWLOCK KIT,F,USE WITH METAL SHELL"D"CONN	EA	1.000	AMP\207952-1	31
5310	69393		SWITCHING SHELL,15 PIN SUBMIN"D"	EA	1.000	CIN\DA19678-6	32
5320	1010555-501	B	HARNESS ASSY,PS,50S1G4A	EA	1.000		33
5330	11010		SCREW,MACH,PAN HD,CROSS-REC,S/S,4-40 X .25	EA	2.000	\MS51957-13	34
5355	69166		GROMMET,CATERPILLAR,NAT'L COLOR,.125 MAT'L THK	EA	A/R		37
5360	11065		SCREW,MACH,FLT HD,100 DEG,CROSS-REC,S/S,6-32 X .50	EA	2.000	\MS24693-C28	38
5370	11143		SCREW,MACH,FL HD,100 DEG,CROSS-REC,S/S,8-32 X .25	EA	4.000	\MS24693-C46	39
5380	11014		SCREW,MACH,PAN HD,CROSS-REC,S/S,6-32 X .25	EA	4.000	\MS51957-26	40

BILL NO: 1010555-501 REV: B U/M: EA DRAWING NO:
HARNESS ASSY,PS,50S1G4A

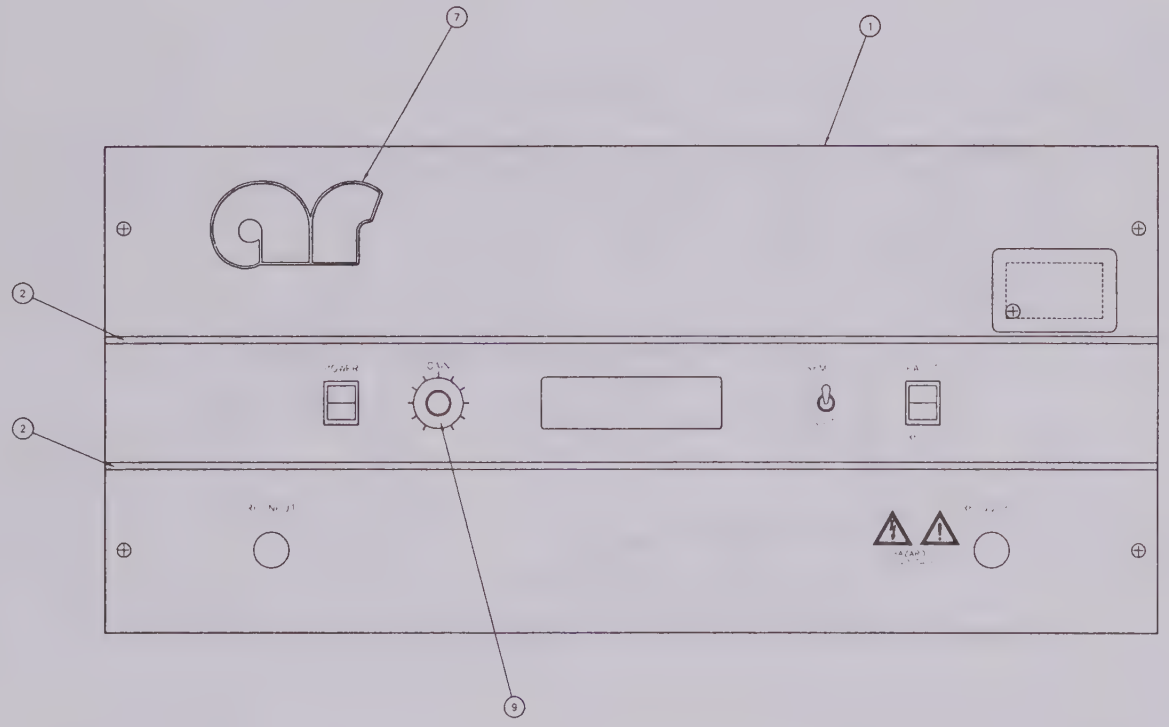
SEQ	PART NUMBER	REV	D E S C R I P T I O N	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
0010	1010556	B	WIRE LIST,PS ASSY	EA	REF	ARC-A\1010556	
0015	1010552	D	SCHEM DIAG,50S1G4A	EA	REF	ARC-D\1010552	
0020	1010889-101	-	HARNESS BD,MODEL 50S1G4A	EA	REF		
1500	41246		CONN,PLUG,44PIN,M	EA	1.000	AMP\748366-1	J1
1510	41244		TERM,CRIMP,TYP,M,20-28AWG	EA	38.000	AMP\748333-7	J1
1520	41272		CONN HOOD,CABLE CLAMP,PLASTIC,44 PIN	EA	1.000	AMP\207345-1	J1
1530	41158		CONN,SUBMINI "D",FILTD,15 PIN,(F)	EA	1.000	AMH\FCC17A15SM340	J3
2200	41182		CONN,PLUG,3 PIN,(F),18 AWG	EA	1.000	PNT\CT156F18-3	P3
2210	41059		CONN,THRU COVER,3 PIN	EA	1.000	PNT\TC156F-3-C	P3
2220	41075		CONN,PLUG,6 PIN,(F)	EA	1.000	PNT\CT156F22-6-C	P4
2230	41060		CONN,THRU COVER,6 PIN	EA	1.000	PNT\TC156F-6-C	P4
2240	41131		CONN,RECEPT,W/EARS & DETENT LOCK,9 CKT,M	EA	2.000	MOL\03-09-1092	P7 ,P13
2250	41105		TERM,.093 DIA,CRIMP TYPE,F,18-22 AWG	EA	11.000	MOL\02-09-1119	P7 ,P13
2260	41215		CONN,RECEPT,10 CKT,W/CONTACTS	EA	1.000	AST\70-841-004	P8
2270	41280		CONN,PLUG,14 POS	EA	1.000	BEG\69176-014	P9
2280	41267		TERM,.025 SQUARE,CRIMP TYPE,F,22-26 AWG	EA	13.000	BEG\47747-000	P9
2290	41188		CONN,PLUG,20 PIN,(F)	EA	2.000	PNT\CT100F22-20-Q	P10 ,P12
2300	41189		COVER,CONN,20 PIN	EA	2.000	PNT\TC100F-20-Q	P10 ,P12
2310	41166		CONN,SUBMINI"D",NON-FILTD,15 PIN (M)	EA	1.000	AMH\117DA15P	P11
2320	41107		TERM,.093 DIA,CRIMP TYPE,M,18-22 AWG	EA	1.000	MOL\02-09-2118	P13
2330	41299		TERM,.093 DIA,CRIMP,TYPE F,24-30AWG	EA	6.000	MOL\02-09-1144	P13
5000	69136		TERM,INSUL,PUSH-ON,F,16-14 AWG,.032 X .250 TAB	EA	5.000	TAB\RB-257	
5010	69145		TERM,RING,INSUL,#10 STUD,16-14 AWG	EA	11.000	TAB\RB-877	
5020	69139		TERM,RING,INSUL,#10 STUD,8 AWG	EA	1.000	TAB\RD-367	

BILL NO: 1010555-501 REV: B U/M: EA DRAWING NO:
HARNESS ASSY,PS,50S1G4A

SEQ	PART NUMBER	REV	D E S C R I P T I O N	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
5030	69143		TERM,RING,INSUL.,#6 STUD,16-14 AWG	EA	1.000	TAB\RB-857	
5040	69140		TERM,RING,INSUL,#6 STUD,22-16 AWG	EA	3.000	TAB\RA-857	
5050	69146		TERM,RING,INSUL,#10 STUD,10 AWG	EA	2.000	TAB\RC-367	
5060	69357		TERM,INSUL,PUSH-ON,R.A.,F,16-14,AWG,.032X.250 TAB	EA	2.000	TAB\RB2577F	
5070	69323		TERM,INSUL,PUSH-ON,F,22-18 AWG,.020 X .110 TAB	EA	6.000	TAB\RA18-111F	
5080	69137		TERM,INSUL,PUSH-ON,F,22-18 AWG,.032 X .250 TAB	EA	2.000	TAB\RA-257	

RD. #2023-01

ECN	DATE	REV
REL	16AUG99	-
10327	13DEC99	A
10353	5JAN00	B



FOR BOM SEE 1010553-501

SHEET	1	2
REV	B	B

ITEM	PART NO.	DESCRIPTION	MARK	FIN	MATL
QTY. REQD.	PARTS LIST				

UNLESS OTHERWISE SPECIFIED
DO NOT SCALE DRAWING
DIMENSIONS ARE IN INCHES AND INCLUDE PLATING THICKNESS
ALL TOLERANCES UNSPECIFIED
REMOVE ALL BURRS AND SHARP EDGES

BASIC DIMENSIONS	2 PLACE DECIMALS	3 PLACE DECIMALS
UP TO 6	± .02	± .005
OVER 6 TO 24	± .03	± .010
OVER 24	± .05	± .015

DRAWN G.JACKSON DATE 3 MAY 99
CHKD G.JACKSON DATE 3 MAY 99
MECH J MAGINN DATE 8/18/99
ELEC F.SCHINK DATE 17 AUG 99

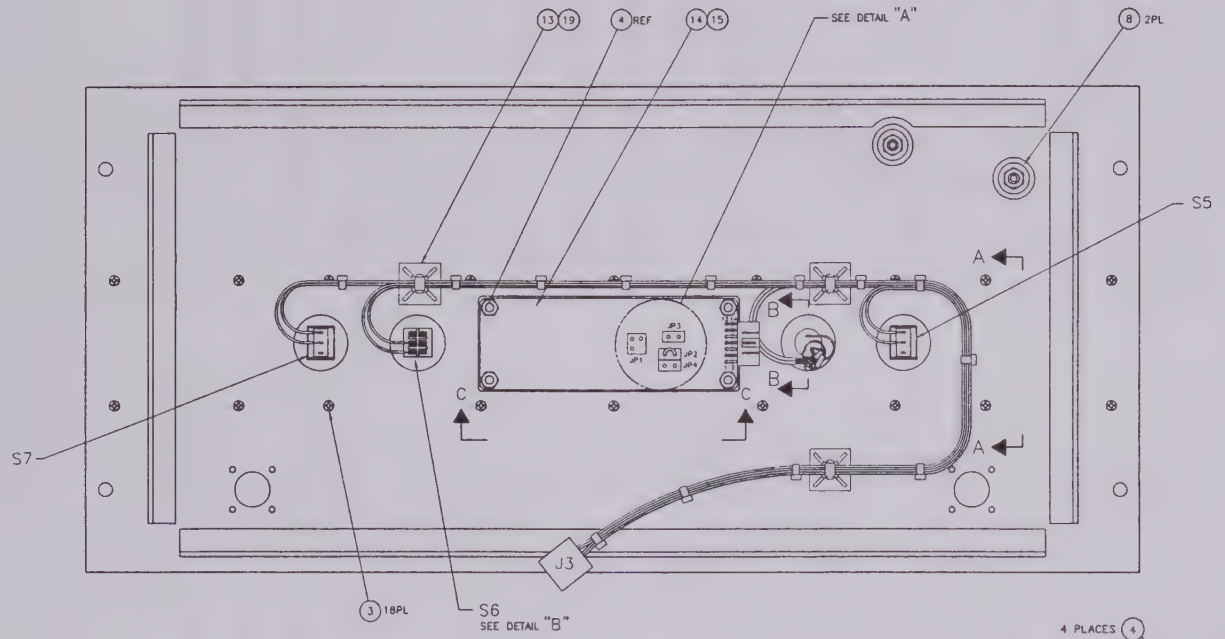
AMPLIFIER RESEARCH

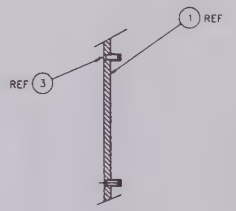
CTRL PANEL ASSY

DWG. NO. 1010553

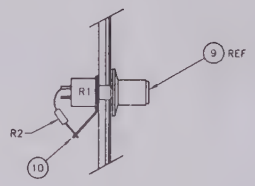
SCALE 1/1 SHEET 1 OF 2 REV B

5051G4A USED ON MODEL

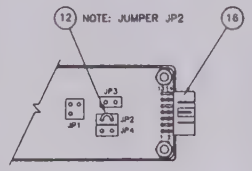




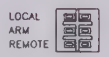
SECTION A–A
9 PLACES



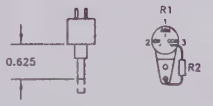
SECTION B–B



DETAIL "A"

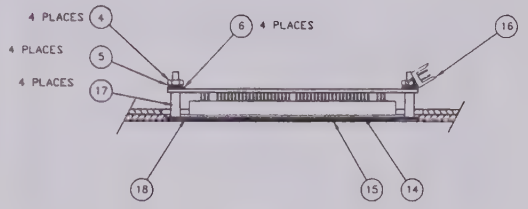


DETAIL "B"



DETAIL OF R1

THE SHAFT OF R1 MUST BE TRIMMED IF IT IS GREATER THAN .625" FROM THE BASE OF THE THREADED SHOULDER. DO NOT TRIM TO LESS THAN .625".



SECTION B–B

NOTE:
ITEM 15, FILTER, MUST HAVE THE FLAT (NON-SHINEY) SIDE DISPLAYING TO THE OUTSIDE.

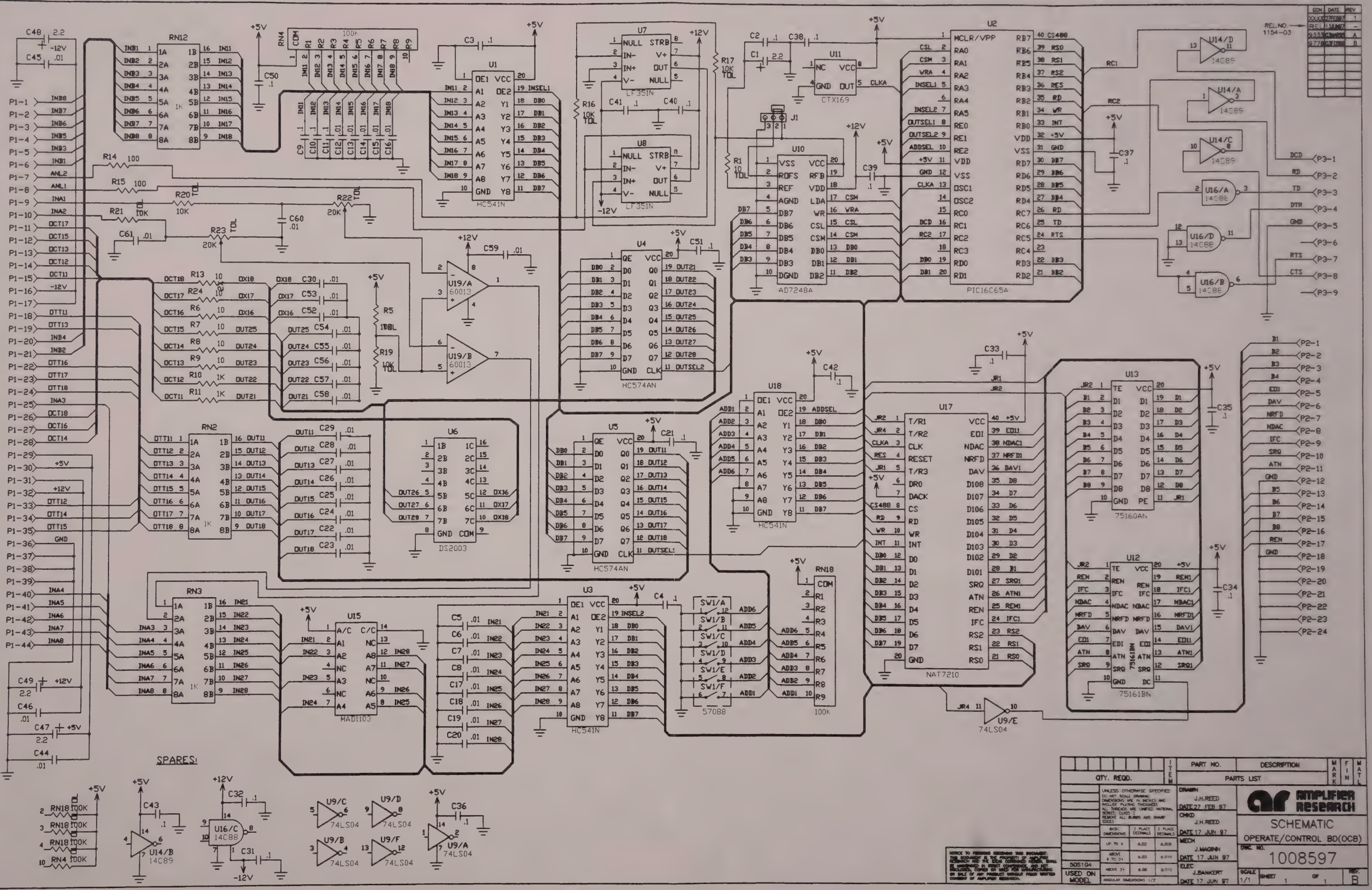
DWG. NO.	1010553	
SCALE 1/1	SHEET 2 OF 2	REV. B

BILL NO: 1010553-501 REV: B U/M: EA DRAWING NO: ARC-D\1010553
CTRL PNL ASSY

SEQ	PART NUMBER	REV	D E S C R I P T I O N	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
0010	1010553	B	ASSY DWG,CTRL PNL	EA	REF	ARC-D\1010553	
0020	1010717	-	WIRE LIST,CTRL PNL	EA	REF	ARC-A\1010717	
2200	41103		CONN,PLUG,9 PIN	EA	1.000	MOL\03-09-2092	J3
2210	41107		TERM,.093 DIA,CRIMP TYPE,M,18-22 AWG	EA	8.000	MOL\02-09-2118	J3
2700	55901	-	RES,VAR,CP,10K,10%,1/2W	EA	1.000	CLA\RV6NAYSA103A	R1
2710	55612-1202J	-	RES,FXD,METAL FILM,12K,5%,1/4-1/2W	EA	1.000	TRW\GP55-1202+/-5%	R2
3100	57042		SW,TOGGLE,MINI,DPDT,5A,125VAC	EA	1.000	A-S\MST-205N	S6
3120	57089	-	SW,PB,MOM.SPDT(N.O.)	EA	2.000	CKS\8121J81ZGE22	S5 ,S7
5000	1010542-301	A	PNL,CTRL	EA	1.000	ARC-D\1010542	1
5020	1008867-101-F2	A	RAIL,TRIM	EA	2.000	ARC-C\1008867	2
5030	11100		SCREW,MACH,FLT HD,100 DEG,CROSS-REC,S/S,2-56X.25	EA	18.000		3
5040	13003		NUT,HEX,S/S,4-40,.187AF	EA	4.000		4
5050	12047		WASH,LOCK,SPLIT,S/S,#4	EA	4.000	\MS35338-135	5
5060	12010		WASH,FLAT,S/S,#4,.250 OD X .125 ID X .022 THK	EA	4.000	\MS15795-803	6
5070	1006361-101	A	LOGO,DIECAST,1.50	EA	1.000	ARC-B\1006361	7
5080	14001	-	FASTENER,PALNUT,WASH TYPE,SELF THDG	EA	2.000	TRW\SD188009-SOH	8
5090	69018		KNOB,SKIRTED,1/8"SHAFT,MATTE FINISH	EA	1.000	ROG\MF-RB-67-0SK7M	9
5100	69242		LUG,SHAKEPROOF,13/16 L,#1/4 STUD,DUAL HOLE	EA	1.000	HHS\1410-14	10
5120	66047		WIRE,BUSS,TINNED COPPER,22 AWG	IN	A/R	ALP\9022	12
5130	69162		CABLE TIES,7/8 MAX BUNDLE DIA,4 L	EA	A/R	DEN\08432	13
5140	69384		DISPLAY,VAC FLUORESCENT,2 ROWS,20 CHARACTERS	EA	1.000	NOR\CU20025ECPBU1J	14
5150	1009173-101	B	FILTER,AMBER,2 LINE DISPLAY	EA	1.000	ARC-B\1009173	15
5160	41279		CONN,HEADER,R/A,14 POS	EA	1.000	BEG\78207-114	16
5170	14056		SPACER,RND,ALUM,.125 ID X .167 OD X .437 LG	EA	4.000	KEY\401	17

BILL NO: 1010553-501 REV: B U/M: EA DRAWING NO: ARC-D\1010553
CTRL PNL ASSY

SEQ	PART NUMBER	REV	D E S C R I P T I O N	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
5180	1010628-101	-	RETAINER,FILTER	EA	1.000	ARC-B\1010628	18
5190	69238	-	BASE,MTG,CABLE TIE,ADH BACK,3/4 X 3/4	EA	A/R	TAB\TC-344A	19


RN12
RN4
RN2
RN3
U1
HC541N
U7
LF351N
U8
LF351N
U2
PIC16C65A
U10
AD7248A
U11
CTX169
U4
HC574AN
U5
HC574AN
U6
DS2003
U18
HC541N
U15
MAD1103
U19/A
60013
U19/B
60013
U14/A
14C89
U14/B
14C89
U14/C
14C89
U14/D
14C89
U16/A
14C86
U16/B
14C86
U16/C
14C88
U16/D
14C88
U17
NAT7210
U13
75160AN
U12
75161BN
U9/A
74LS04
U9/B
74LS04
U9/C
74LS04
U9/D
74LS04
U9/E
74LS04
U9/F
74LS04
RN18
100K
SW1/A
SW1/B
SW1/C
SW1/D
SW1/E
SW1/F
57088
J1
SPARES
REL.NO. 1154-03
AMPLIFIER RESEARCH
SCHEMATIC
OPERATE/CONTROL BD(OCB)
DWG. NO. 1008597
DRAWN J.H.REED DATE 27 FEB 97
CHKD J.H.REED DATE 17 JUN 97
MECH J.MAGINN DATE 17 JUN 97
ELEC J.BANKERT DATE 17 JUN 97
SCALE 1/1
SHEET 1 OF 1
REV B
USED ON 5051G4 MODEL
PARTS LIST
QTY. REQD.
ITEM
PART NO.
DESCRIPTION
MARK
FIN
MATL

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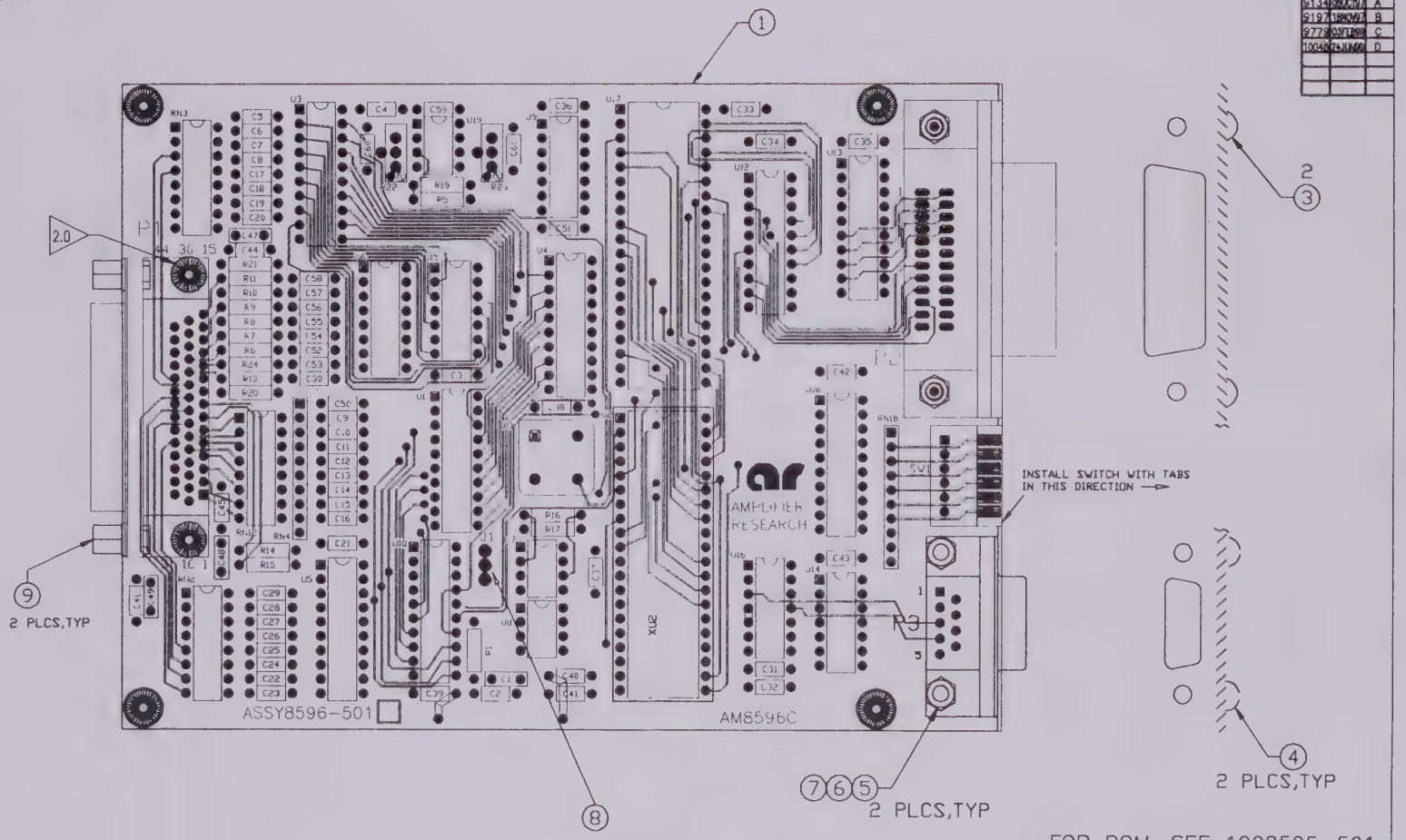
ECN	DATE	REV
XXXX	11MAR97	1
XXXX	01JUL97	2
REL	17AUG97	–
9134	09OCT97	A
9197	18NOV97	B
9775	05FEB98	C
10048	26JUN98	D



FOR BOM, SEE 1008595-501

NOTES:

1.0 USE SOCKET ONLY ON U2.

2.0 MOUNTING TABS, SOLDER 2 PLACES

3.0 THIS IS A MULTI-LAYER BOARD, USE CARE IN INSTALLING OR REMOVING COMPONENTS.

4.0 SOLDER FROM FAR SIDE ONLY, USING MINIMUM HEAT.

ITEM	QTY. REQD.	PART NO.	DESCRIPTION	MARK	FIN	MATL
		PARTS LIST				

UNLESS OTHERWISE SPECIFIED
DO NOT SCALE DRAWING
DIMENSIONS ARE IN INCHES AND INCLUDE PLATING THICKNESS
ALL THREADS ARE UNIFIED NATIONAL SERIES CLASS 2
REMOVE ALL BURRS AND SHARP EDGES

BASIC DIMENSIONS	2 PLACE DECIMALS	3 PLACE DECIMALS
UP TO 6	±.02	±.006
ABOVE 6 TO 24	±.03	±.010
ABOVE 24	±.06	±.018

ANGULAR DIMENSIONS 1/2°

50S1G4
USED ON MODEL

DRAWN J.H.REED DATE 14 FEB 97
CHKD J.H.REED DATE 17 JUN 97
MECH J.MAGINN DATE 20 AUG 97
ELEC F.SCHIRK DATE 21 AUG 97

AMPLIFIER RESEARCH

ASSEMBLY DRAWING
OPERATE/CONTROL(OCB)

DWG. NO. 1008595

SCALE 2 : 1 | SHEET 1 OF 1 | REV. D

BILL NO: 1008595-501 REV: C U/M: EA DRAWING NO: ARC-C\1008595
PWB ASSY,OPERATE/CONTROL(OCB)

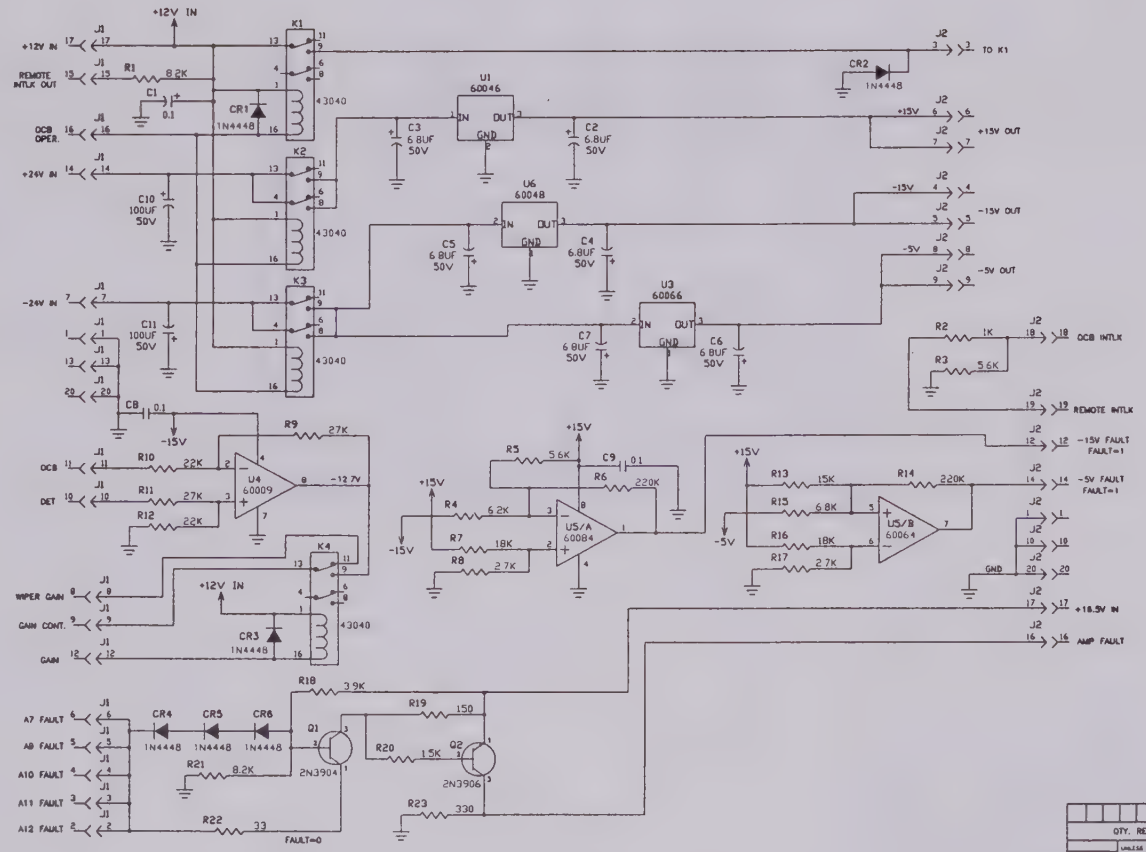
SEQ	PART NUMBER	REV	D E S C R I P T I O N	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
0010	1008597	B	SCHEM DIAG,OPERATE/CONTROL(OCB)	EA	REF	ARC-D\1008597	
0020	1008595	D	ASSY DWG,OPERATE/CONTROL(OCB)	EA	REF	ARC-C\1008595	
0400	27229		CAPR,CER,2.2uF,50V	EA	4.000	\RPE210Z5U225Z050V	C1 ,C47 C48 ,C49
0410	27236		CAPR,FXD,DIP SPACED CER,.1UF,50VDC	EA	22.000	AVX\MD015C104MAA	C2 ,C3 C4 ,C9 C10 ,C11 C21 ,C31 C32 ,C33 C34 ,C35 C36 ,C37 C38 ,C39 C40 ,C41 C42 ,C43 C50 ,C51
0420	27263		CAPR,FXD,DIP SPACED CER,.01uF,100V	EA	35.000	AVX\MD011C103KAB	C5 ,C6 C7 ,C8 C12 ,C13 C14 ,C15 C16 ,C17 C18 ,C19 C20 ,C22 C23 ,C24 C25 ,C26 C27 ,C28 C29 ,C30 C44 ,C45 C46 ,C52 C53 ,C54 C55 ,C56 C57 ,C58 C59 ,C60 C61
1500	41310		CONN,LOCKING HEADER,STR,3 PIN,.10 CTRS	EA	1.000	MOL\22-10-2031	J1
2200	41234		CONN,RECEPT,44 CKT,R.A. PC MOUNT	EA	1.000	AMP\748482-5	P1
2210	41241		CONN,RECEPT,24PIN	EA	1.000	AMP\553811-1	P2
2220	41242		CONN,RECEPT,9 PIN	EA	1.000	AMP\745781-4	P3
2700	55612-10R0F		RES,FXD,FILM,10 OHM	EA	7.000	\RN55D10R0F	R1 ,R6 R7 ,R8

BILL NO: 1008595-501 REV: C U/M: EA DRAWING NO: ARC-C\1008595
PWB ASSY,OPERATE/CONTROL(OCB)

SEQ	PART NUMBER	REV	D E S C R I P T I O N	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
							R9 ,R13 R24
2710	55612-1002F		RES,FXD,PRECISION,10K,1%,1/4-1/2W,CHAR.D	EA	6.000	MFG\RN55D1002F	R5 ,R16 R17 ,R19 R20 ,R21
2720	55612-1001F		RES,FXD,PRECISION,1K,1%,1/4-1/2W,CHAR.D	EA	2.000	MFG\RN55D1001F	R10 ,R11
2730	55612-1000F		RES,FXD 100 OHM1/4W,1%	EA	2.000	MFG\RN55D1000F	R14 ,R15
2740	55920		RES,VAR,CERMET,MULTITURN,TOP ADJ,20K,10%,1/2W	EA	2.000	BOR\3299Y-1-203	R22 ,R23
2750	55946		RES,16PIN DIP,1K	EA	3.000	BOR\4116R-001-102	RN2 ,RN3 RN12
2760	55943		RES,10 PIN SIP,100K,100MW	EA	2.000	CTS\770-101-R-100K	RN4 ,RN18
3100	57088		SWITCH,DIP ROCKER,6 POS	EA	1.000	GRY/76PSB06	SW1
3700	60087		I.C.,NON-INVERTING BUFFER	EA	3.000	NSI\MM74HC541N	U1 ,U3 U18
3720	60088		I.C.FLIP-FLOP	EA	2.000	NSI\MM74HCD574N	U4 ,U5
3730	60093		I.C.DARLINGTON DRIVER	EA	1.000	NSI\DS2003CN	U6
3740	60096		I.C.OP AMP	EA	2.000	NSI\LF351N	U7 ,U8
3750	60091		I.C.HEX INVERTER	EA	1.000	NSI\DM74LS04N	U9
3760	60090		I.C.CMOS DAC	EA	1.000	AND\AD7248AAN	U10
3770	25062		OSC,CLOCK 20MHZ	EA	1.000	CTS\MXO45HS	U11
3780	60123		IC,TRANSCEIVER,8 CHANNEL	EA	1.000	TII\SN75161BN	U12
3790	60097		I.C.TRANSCEIVER	EA	1.000	NSI\DS7516OAN	U13
3800	60094		I.C.RECEIVER,CMOS	EA	1.000	MAX\MAX1489ECPD	U14
3810	60089		I.C.DIODE ARRAY	EA	1.000	MOT\MAD1103P	U15
3820	60095		I.C.CMOS LINE DRIVER	EA	1.000	MAX\MAX1488ECPD	U16
3830	60086		I.C.NEC MPD7210 REPLACEMENT	EA	1.000	NSI\NAT7210APD	U17
3840	60013		INTEGRATED CKT,LINEAR,DUAL,OP.AMP.	EA	1.000	RCA\CA3240AE	U19

BILL NO: 1008595-501 REV: C U/M: EA DRAWING NO: ARC-C\1008595
PWB ASSY,OPERATE/CONTROL(OCB)

SEQ	PART NUMBER	REV	D E S C R I P T I O N	U/M	QUANTITY	PER	DRAWING NUMBER	REF-DSGN
4510	73031		SOCKET,IC,40PIN	EA	1.000		TII\C93-40-02	XU2
5000	1008596-101	C	PWB,OPERATE/CONTROL(OCB)	EA	1.000		ARC-C\1008596	1
7100	11032		SCREW,MACH,PAN HD,CROSS-REC,S/ZN,4-40X.38,TYPE SW	EA	A/R			3
7110	11011		SCREW,MACH,PAN HD,CROSS-REC,S/S,4-40 X .38	EA	A/R		\MS51957-15	4
7500	12010		WASH,FLAT,S/S,#4,.250 OD X .125 ID X .022 THK	EA	A/R		\MS15795-803	5
7510	12047		WASH,LOCK,SPLIT,S/S,#4	EA	A/R		\MS35338-135	6
7520	13003		NUT,HEX,S/S,4-40,.187AF	EA	A/R			7
7530	53025		SHUNT,2 PIN	EA	1.000		D-K\929955-06-ND	8
7540	69262		SCREWLOCK KIT,F,USE WITH METAL SHELL"D"CONN	EA	1.000		AMP\207952-1	9



ECN	DATE	REV
XXXX	15JUN98	1
XXXX	20JUL98	2
REL	28JUL98	-
11765	29JUL98	A

RELEASE NO. 1176-01

ITEM	QTY. REQD.	PART NO.	DESCRIPTION	MARK	FINL	MATL
		PARTS LIST				

UNLESS OTHERWISE SPECIFIED DO NOT SCALE DRAWING DIMENSIONS ARE IN INCHES AND TOLERANCES ARE AS FOLLOWS: N.C. FRACTIONS ±1/64 UNLESS OTHERWISE SPECIFIED

DECIMALS	2 PLACE ±.03	3 PLACE ±.015
ANGLES ± 10 '	± .02	± .005
ANGLES ± 30 '	± .03	± .010
ANGLES ± 1 °	± .05	± .015

DRAWN	J.M.REED
DATE	15 JUNE 98
CHKD	J.M.REED
DATE	28 JULY 98
MECH	J.MAGINN
DATE	31 JULY 98
ELEC	J.BANKERT
DATE	31 JULY 98

AMPLIFIER RESEARCH

SCHEMATIC

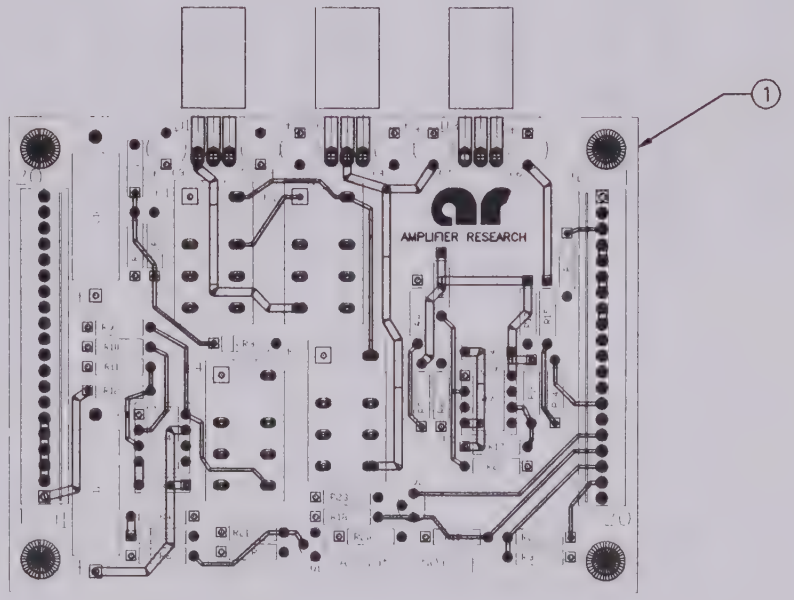
REGULATOR CONTROL(25,10S1G4

DWG. NO. 1009511

25S1G4 USED ON MODEL	SCALE NONE	SHEET 1 OF 1	REV. A

ECN	DATE	REV
XXXX	23 JUNE 98	1
REL	28 JULY 98	–

RELEASE NO.
1178-01



FOR BOM: SEE 1009512-501

ITEM	QTY. REQD.	PART NO.	DESCRIPTION	MARK	FIN	MATL
		PARTS LIST				

UNLESS OTHERWISE SPECIFIED
DO NOT SCALE DRAWING
DIMENSIONS ARE IN INCHES AND INCLUDE PLATING THICKNESS
ALL THREADS ARE UNIFIED NATIONAL SERIES, CLASS 2
REMOVE ALL BURRS AND SHARP EDGES

BASIC DIMENSIONS	2 PLACE DECIMALS	3 PLACE DECIMALS
UP TO 6	±.02	±.005
ABOVE 6 TO 24	±.03	±.010
ABOVE 24	±.06	±.015

ANGULAR DIMENSIONS ±2°

25S1G4
USED ON MODEL

DRAWN J.H.REED DATE 23 JUNE 98
CHKD J.H.REED DATE 28 JULY 98
MECH DATE
ELEC DATE

AMPLIFIER RESEARCH

ASSEMBLY DRAWING
REGULATOR CONTROL(25,10S1G4)

DWG. NO 1009512

SCALE 2/1 SHEET 1 OF 1 REV. —

BILL NO: 1009512-501 REV: - U/M: EA DRAWING NO: ARC-C\1009512
REG CTRL BD ASSY

SEQ	PART NUMBER	REV	D E S C R I P T I O N	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
0010	1009511	A	SCHEM DIAG,REG CTRL BD	EA	REF	ARC-D\1009511	
0020	1009512	-	ASSY DWG,REG CTRL BD	EA	REF	ARC-C\1009512	
0400	27236		CAPR,FXD,DIP SPACED CER,.1UF,50VDC	EA	3.000	AVX\MD015C104MAA	C1 ,C8 C9
0410	27055		CAPR,TANT,6.8UF,50V	EA	6.000	MAL\TDC685K050NLF	C2 ,C3 C4 ,C5 C6 ,C7
0420	27068		CAPR,ELECT,100uF,50VDC,AXIAL	EA	2.000	ICI\107TTA050M	C10 ,C11
0700	1N4448		DIODE,SIGNAL,75V PIV	EA	6.000	FCH\1N4448	CR1 ,CR2 CR3 ,CR4 CR5 ,CR6
1500	41187		CONN,LOCKING HEADER,STR,20 PIN,.10 CNTRS	EA	2.000	PNT\MLSS100-20	J1 ,J2
1700	43040		RELAY,LO-PWR,DPDT,12VDC,360 OHMS,PIN L POS	EA	4.000	ARO/DS2EMDC12V	K1 ,K2 K3 ,K4
2500	2N3904		XSTR,SWNG,NPN,40V,0.2A,1W	EA	1.000		Q1
2510	2N3906		XSTR,SWNG,PNP,40V,0.2A,1W	EA	1.000	ARE\2N3906	Q2
2700	55612-8201J		RES,FXD,METAL FILM,8.2K,5%,1/4-1/2W	EA	2.000	TRW\GP55-8201+/-5%	R1 ,R21
2710	55612-1001J		RES,FXD,METAL FILM,1K,5%,1/4-1/2W	EA	1.000	TRW\GP55-1001+/-5%	R2
2720	55612-5601J		RES,FXD,METAL FILM,5.6K,5%,1/4-1/2W	EA	2.000	TRW\GP55-5601+/-5%	R3 ,R5
2730	55612-6201J	-	RES,FXD,METAL FILM,6.19K,1%,1/4W	EA	1.000	IRC\RN55D6191F	R4
2740	55612-2203J		RES,FXD,METAL FILM,220K,1%,1/4-1/2W	EA	2.000	TRW\GP55-2203+1-5%	R6 ,R14
2750	55612-1802J		RES,FXD,METAL FILM,18K,5%,1/4-1/2W	EA	2.000	TRW\GP55-1802+/-5%	R7 ,R16
2760	55612-2701J		RES,FXD,METAL FILM,2.7K,5%,1/4-1/2W	EA	2.000	TRW\GP55-2701+/-5%	R8 ,R17
2770	55612-2702J		RES,FXD,METAL FILM,27K,5%,1/4-1/2W	EA	2.000	TRW\GP55-2702+/-5%	R9 ,R11
2780	55612-2202J		RES,FXD,METAL FILM,22K,5%,1/4-1/2W	EA	2.000	TRW\GP55-2202+/-5%	R10 ,R12
2790	55612-1502J		RES,FXD,METAL FILM,15K,5%,1/4-1/2W	EA	1.000	TRW\GP55-1502+/-5%	R13
2800	55612-6801J		RES,FXD,METAL FILM,6.8K,5%,1/4-1/2W	EA	1.000	TRW\GP55-6801+/-5%	R15

BILL NO: 1009512-501 REV: - U/M: EA DRAWING NO: ARC-C\1009512
REG CTRL BD ASSY

SEQ	PART NUMBER	REV	D E S C R I P T I O N	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
2810	55612-3901J		RES,FXD,METAL FILM,3.9K,5%,1/4-1/2W	EA	1.000	TRW\GP55-3901+/-5%	R18
2820	55612-1500J		RES,FXD,METAL FILM,150,5%,1/4-1/2W	EA	1.000	TRW\GP55-1501+/-5%	R19
2830	55612-1501J		RES,FXD,METAL FILM,1.5K,5%,1/4-1/2W	EA	1.000	TRW\GP55-1501+/-5%	R20
2840	55512-33R0J		RES,FXD,CARBON COMP,33,5%,1/4W	EA	1.000	A-B\CB3305	R22
2850	55612-3300J		RES,FXD,METAL FILM,330,5%,1/4-1/2W	EA	1.000	TRW/GP55-330 +/-1%	R23
3700	60046		INTEGRATED CKT,3 TERM,POS REG.	EA	REF	MOT\MC7815CT	U1
3710	60066		IC,3 TERM,NEG REG	EA	REF	MOT\MC7905CT	U3
3720	60009		INTEGRATED CKT,LINEAR,OP.AMP.	EA	1.000	RCA\CA3140AE	U4
3730	60064		IC,DUAL,COMPARATOR	EA	1.000	MOT\LM393AN	U5
3740	60048		INTEGRATED CKT,3 TERM,NEG REG.	EA	REF	MOT\MC7915CT	U6
4500	73010		SOCKET,I.C.,8 PIN,DIP	EA	2.000	TII\C93-08-02	XU4 ,XU5
5000	1009513-101	-	PWB,REG CTRL	EA	1.000	ARC-B\1009513	1

SECTION VI

RECOMMENDED SPARE PARTS

6.1 LEVEL OF MAINTENANCE

Three separate lists of parts are recommended for maintenance of the related amplifier. Each list will contain parts that will be required for repairs to be performed at a particular level of technical expertise and equipment needed to perform this level of maintenance. The three levels of maintenance are as follows.

Level 1—Technician Level

Performed at equipment location with connectorized items. Limited to replacement of printed wiring boards (PWBs), amplifier assemblies, fuses. and so forth. Requires qualified technical personnel. Suggested when down time must be minimized.

Level 2—Field Service/Shop Level

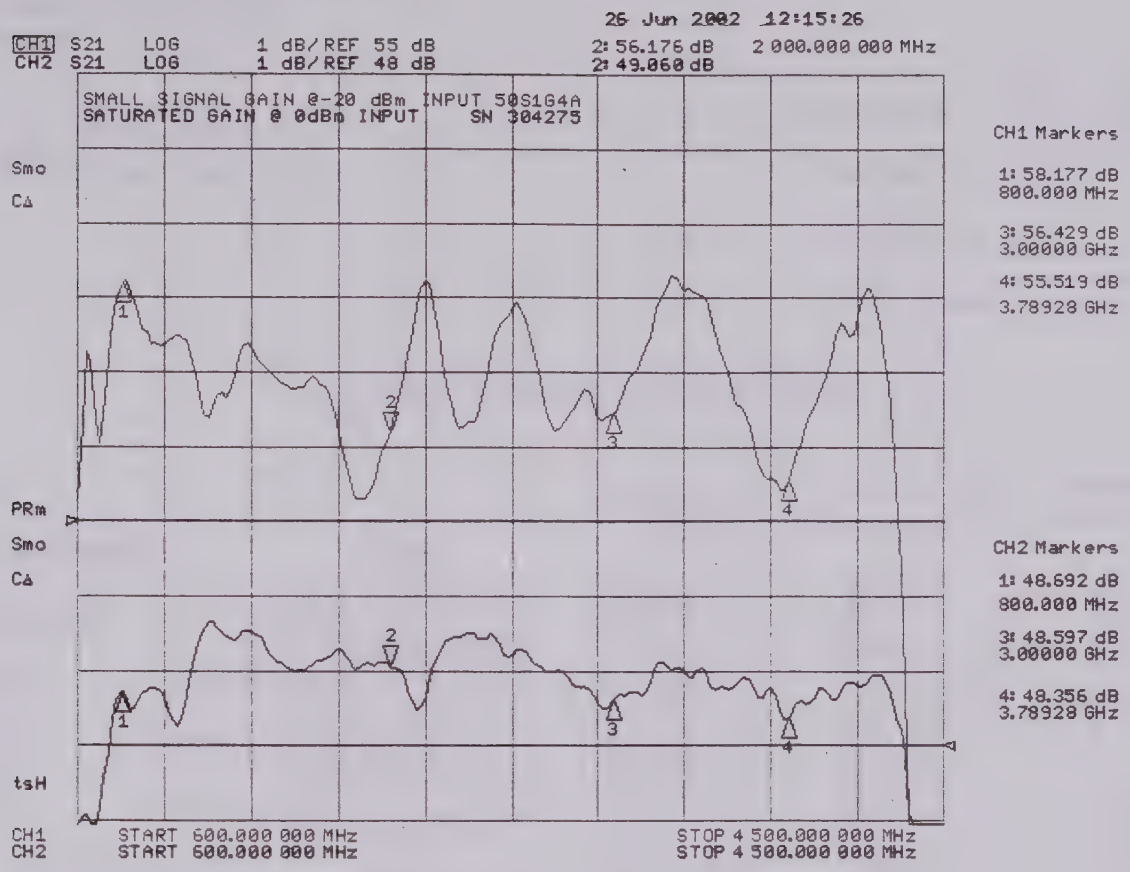
Parts replacement requiring minimum adjustment or alignment. Includes PWB repair, and replacement of controls, power supply components, fans, and individual Radio Frequency (RF) components that would not adversely affect the amplifier's alignment.

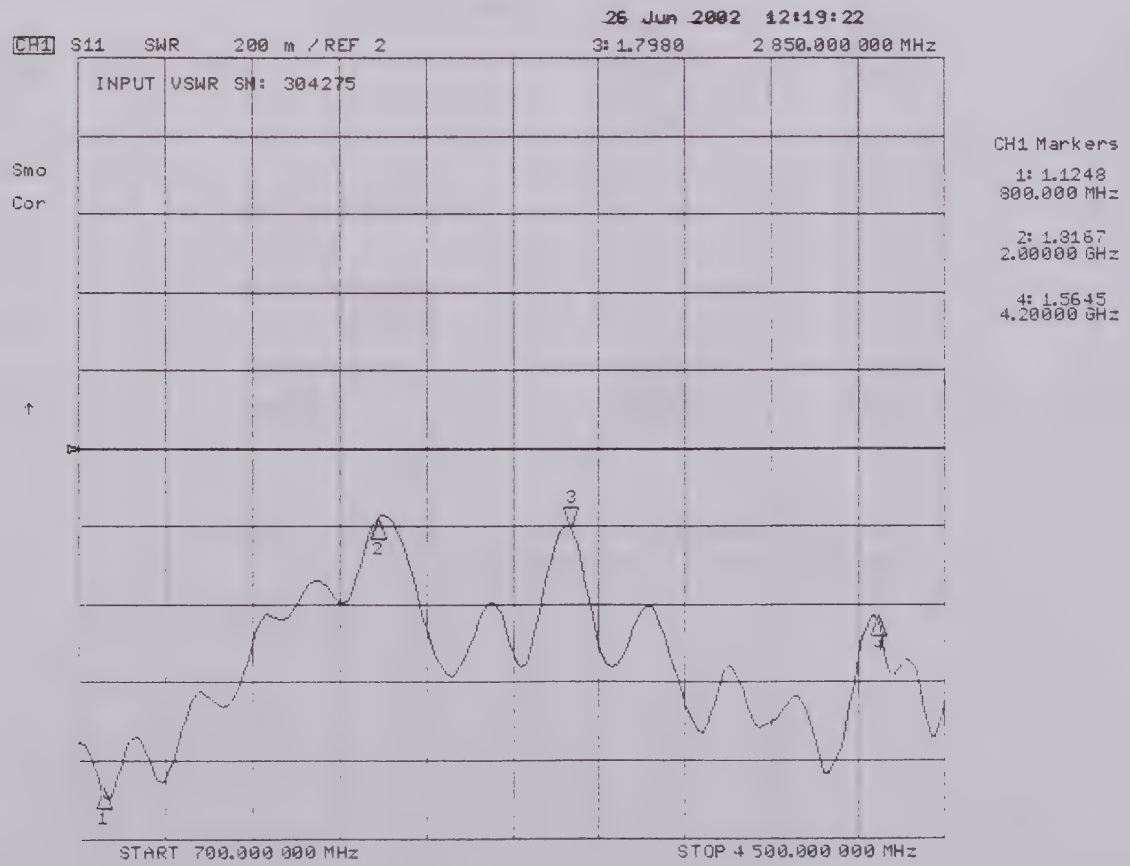
Level 3—Factory-Authorized Level

Repairs that require amplifier alignment or major adjustments. To be performed by a qualified technical staff in a properly instrumented laboratory.

BILL NO: 1010539-501 REV: A U/M: EA DRAWING NO: ARC-D\1010539
MODEL 50S1G4A,0.8-4.2 GHz,50 WATTS CW

ITM	PART NUMBER AND DESCRIPTION	DRAWING NUMBER	REV	U/M	SCRAP PCTG	MRP	MANF CLASS	QUANTITY-PER	SPARE-QTY	LEVEL	REFERENCE DESIGNATORS
1	55901 RES,VAR,CP,10K,10%,1/2W	CLA\RV6NAYSA103A	-	EA		P	RV12	0.000 0.000	0	2 3	R1
2	57042 SW,TOGGLE,MINI,DPDT,5A,125VAC	A-S\MST-205N		EA		P	SW01	0.000 0.000	0	2 3	S6


26 Jun 2002 12:15:26
CH1 S21 LOG 1 dB/ REF 55 dB
2: 56.176 dB
2 000.000 000 MHz
CH2 S21 LOG 1 dB/ REF 48 dB
2: 49.060 dB
SMALL SIGNAL GAIN @-20 dBm INPUT 50S1G4A
SATURATED GAIN @ 0dBm INPUT SN 304275
Smo
CA
PRm
Smo
CA
tsH
CH1 START 600.000 000 MHz
CH2 START 600.000 000 MHz
STOP 4 500.000 000 MHz
STOP 4 500.000 000 MHz
CH1 Markers
1: 58.177 dB
800.000 MHz
3: 56.429 dB
3.00000 GHz
4: 55.519 dB
3.78928 GHz
CH2 Markers
1: 48.692 dB
800.000 MHz
3: 48.597 dB
3.00000 GHz
4: 48.356 dB
3.78928 GHz


26 Jun 2002 12:19:22
CH1 S11 SWR 200 m / REF 2
3: 1.7980
2 850.000 000 MHz
INPUT VSWR SN: 304275
Smo
Cor
START 700.000 000 MHz
STOP 4 500.000 000 MHz
CH1 Markers
1: 1.1248
800.000 MHz
2: 1.8167
2.00000 GHz
4: 1.5645
4.20000 GHz

AR AMPLIFIER REASEARCH

Model No.	50S1G4A
Serial No.	304275
Tested By	RJS
Date	6-25-02

1 dB Compresion Test

EST EQUIPMENT		S/N
letwork Analyzer	TEC-NA	2052
ower Meter	TEC-PM	1410
ixed Atten.	TEC-AT	1961
ixed Atten.	TEC-AT	1935

INIMUM GAIN 26 dB @ 0.40 WATTS OUTPUT (at 2000 MHz)

ATNESS ± 1.5 dB

EN TEST ✓

ORT TEST ✓

ABILITY ✓

URIOUS ✓

UT VSWR < 2.0:1

ORDER ITERMOD ✓

REMOTE IEEE-488/ RS-232 ✓

LINE VOLTAGE PREFORMANCE ✓

INPUT ATTEN RANGE ✓

Frequency (MHz)	Power @ 1dB comp. (W)	Power Output Saturated (W)
800.00	59.70	68.23
1000.00	68.87	67.45
1250.00	73.28	74.99
1500.00	68.71	71.12
1750.00	58.34	71.94
2000.00	51.52	68.08
2250.00	59.70	72.11
2500.00	60.95	70.47
2750.00	55.59	66.68
3000.00	47.42	58.75
3250.00	54.95	64.42
3500.00	50.35	60.12
3750.00	48.64	56.49
4000.00	52.00	58.21
4200.00	55.72	63.83
0.00	0.00	0.00

TEST EQUIPMENT CALIBRATION TRACEABLE TO NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY (NIST).

3dbfinnal.vi
C:\WINDOWS\DESKTOP\TESTS\3dbfinnal.vi
Last modified on 5/9/02 at 9:11 AM
Printed on 6/25/02 at 11:27 AM

AR AMPLIFIER REASEARCH

Model No.	50S1G4A
Serial No.	304275
Tested By	RJS
Date	6-25-02

3 dB Compresion Test

TEST EQUIPMENT		S/N
Network Analyzer	TEC-NA	2052
Power Meter	TEC-PM	1410
Fixed Atten	TEC-AT.	1961
Fixed Atten.	TEC-AT	1935

Frequency (MHz)	Power @ 3dB comp. (W)
800.00	66.53
1000.00	73.96
1250.00	79.25
1500.00	75.51
1750.00	71.78
2000.00	62.09
2250.00	69.50
2500.00	69.82
2750.00	65.46
3000.00	56.23
3250.00	64.12
3500.00	59.57
3750.00	53.95
4000.00	55.98
4200.00	63.53

rmfinnal.vi
\WINDOWS\DESKTOP\TESTS\harmfinnal.vi
ıst modified on 5/9/02 at 9:11 AM
inted on 6/25/02 at 11:24 AM

AR AMPLIFIER REASEARCH

MODEL #	50S1G4A
MODEL S/N:	304275
NAME	RJS
DATE	6-25-02

HARMONICS TEST

TEST EQUIPMENT		S/N
Network Analyzer	TEC-NA	2052
Power Meter	TEC-PM	1410
Spectrum Analyzer	TEC-SA	1756
Fixed Attenuator	TEC-AT	1961
Fixed Attenuator	TEC AT	1935

FREQUENCY (MHz)	HARMONIC DISTORTION (-dBc)
800	-20.98
1000	-24.26
1250	-26.45
1500	-30.07
1750	-34.39
2000	-24.14
2250	-33.94
2500	-55.45
2750	-38.28
3000	-38.37
3250	-30.99
3500	-44.99
3750	-33.37
4000	-40.22
4200	-49.81

AMPLIFIER RESEARCH
In compliance to IEC 1010-1
Safety requirements of electrical equipment for laboratory use
Annex K

ROUTINE TESTS

Model : 50S1G4A

Serial No. : 304275

Date : 6-25-02

Inspected By : RJS

s: For equipment with working voltage up to 300 V

Protective earth resistance	Limit	
Apply 25 amps between protective terminal and ACCESSIBLE parts. Record resistance.	≤ 0.1 ohms	0.05 ohms

Mains circuit insulation	(Circle one)	(√)
Apply voltage from the mains input to chassis for a period of time greater than two (2) seconds. No arcing or breakdown should occur.	1350 VAC (1900 VDC)	√

Floating input terminals	Record Voltage	(√)
Apply 1.5 times working voltage to floating input terminals, where applicable. No arcing or breakdown should occur.	N/A	

JUN 26 2002

WARRANTIES: LIMITATION OF LIABILITY

Seller warrants (i) that seller has title to the goods sold and (ii) that Amplifiers, Antennas, Test Cells, Directional Couplers and Tripods will be free from defects in material and workmanship for a period of three (3) years from date of shipment shown on Amplifier Research invoice. Field Monitoring Equipment and Interference Generators will be free from defects in material and workmanship for a period of two (2) years from date of shipment. Vacuum tubes, traveling-wave tubes and other products will be free from defects in material and workmanship for a period of one (1) year. Seller's sole responsibility in fulfilling these warranties shall be to repair or replace any goods which do not conform to the foregoing warranties or, at seller's option, to give buyer credit for defective goods. The warranty is valid only when used in the country specified at time of order. Warranty service must be obtained from the repair facility designated at that time. If warranty service is not available in the country where the equipment is to be used then it must be returned to Amplifier Research. Warranty service will be provided only for defective goods which are returned within the warranty period, freight costs prepaid to Amplifier Research or its designated repair facility.

There are no other warranties, express or implied, including any warranty of merchantability or fitness. Seller shall not be responsible for any incidental or consequential damages arising from any breach of warranty.

No person other than an officer of Amplifier Research Corporation, has any authority to bind seller to any affirmation, representation or warranty except as specifically included in the preceding terms and conditions.

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